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ABSTRACT

The results of a seminar in which representatives from Australia, New Zealand, and eight Asian countries discussed interdisciplinary research in education are presented. Types of interdisciplinary research were identified, and the conditions necessary for its development were examined. The recent impetus toward interdisciplinary research has emanated from concerns about economic and national development, social justice, the implications for national unity of linguistic and ethnic diversity, and a representation in schools of continuing cultural and social traditions. In some countries there are limitations of knowledge on the part of educational researchers. For example, researchers need to know more about computer and communications technologies. Cooperation and communication among the disciplines and support from the community must be encouraged. Guidelines for the advancement of interdisciplinary educational research are discussed. The annexes, which make up over two-thirds of the report, contain a list of participants and the papers from the individual countries. (RM)

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BROADNING THE SCOPE FOR EDUCATIONAL RESEARCH

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UNESCO-NIER REGIONAL PROGRAMME

BROADNING THE SCOPE FOR EDUCATIONAL RESEARCH

Report of a Regional Seminar

11—20 July 1984

Section for Educational Co-operation in Asia

National Institute for Educational Research (NIER)

Tokyo, Japan

September 1984

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Chapter I

INTRODUCTION

Background

In 1979, the National Institute for Educational Research (NIER) of Japan and Unesco organized jointly a Regional Seminar on Educational Research in relation to Educational Reform in Asia and Oceania. The participants of this seminar made several recommendations on the topics to be taken up in the regional activities organized by Unesco and NIER. In pursuance of the recommendations made at this seminar, a series of seminars and workshops on educational research have been organized by NIER in collaboration with the Unesco Regional Office in Bangkok within the framework of the Asian Programme of Educational Innovation for Development (APEID). These were: A Regional Seminar for the Training of Young Educational Researchers (1981); A Regional Workshop on the Development of Research Concerning the Implementation and Evaluation of Reforms of Educational Content and Methods (1982); and A Regional Seminar on Educational Research with Special Reference to the Exchange of Research Outcomes in Asia and the Pacific (1983).

In the report of the seminar held in 1979, a recommendation was made that a regional seminar should be organized to look into the status of interdisciplinary research in education. In view of the importance of this recommendation in promoting a broader conception of research, more relevant to educational reform and development, NIER decided to organize a Regional Seminar on the Contribution of Interdisciplinary Research to the Development of Education from 11 to 20 July 1984 in collaboration with the Asian Centre of Educational Innovation for Development (ACEID), Unesco Regional Office in Bangkok, within the framework of APEID.

Objectives of the Seminar

The objectives of the Seminar were:

i) To review the current status of interdisciplinary research in education in the participating countries;
ii) To discuss the needs and areas of research which require interdisciplinary approaches for the realization of educational development/reforms; and
iii) To consider ways and means for the promotion of interdisciplinary research in education.

Participation

The Seminar was attended by thirteen participants from ten countries. A list of all participants and the NIER Secretariat is included in Annex I.

Inauguration

The Seminar was inaugurated by Dr. Hiroshi Kida, Director General of NIER. He extended a warm welcome to all the participants of the Seminar and stressed the importance of an interdisciplinary approach to the carrying out of research in education related to its development and reforms.

Mr. Nobuo Nishizaki, Deputy Director General for International Affairs, Minister's Secretariat, Ministry of Education, Science and Culture in Japan welcomed the participants on behalf of the Ministry of Education, Science and Culture as well as the Japanese National Commission for Unesco.

Officers of the Seminar

The Seminar elected the following office bearers:

Chairperson:	Dr. Hiroshi Kida (Japan)
Vice-Chairpersons:	Dr. Yung Dug Lee (Rep. of Korea)
	Dr. Minda C. Sutaria (Philippines)
Rapporteurs:	Dr. S.K. Mitra (India)
	Mr. John E. Watson (New Zealand)

Organization and Documentation

The Seminar met in the morning of 11 July, and after the election of office bearers adopted the following agenda:

- Review of the current status of interdisciplinary research in education in the participating countries;
- In-depth discussion on:
  - i) needs of interdisciplinary research for the realization of educational development and reforms;
  - ii) promotion of interdisciplinary research in education;
- Consideration and adoption of the report;
- Closing of the Seminar.

The first several sessions were devoted to the presentation and discussion of the papers presented by each of the participants. These papers, as finally revised by the participants appear in Annex II of this report. Subsequent sessions, following the presentation of papers were given for bringing together the various ideas, needs, problems and issues, which were discussed and debated in the Seminar. This was followed by in-depth discussion on the issues in the promotion and dissemination of interdisciplinary research in education. The entire draft report was presented for discussion on 19 July. This became possible because NIER provided excellent secretarial assistance in making available promptly the initial drafts prepared by the Rapporteurs, and also relevant extracts from the reports of NIER seminars held on educational research since 1979.

Final Report

The draft of this final report was presented and adopted at the closing session of the Seminar, and the suggestions and modifications suggested at that session have been incorporated into this published version.

Chapter II

HIGHLIGHTS OF COUNTRY EXPERIENCES

A. Clarifying What is Meant by Interdisciplinary Research

Inevitably one of the persistent themes of the discussion in this Seminar, stimulated through the papers presented by the participants, was simply the nature of interdisciplinary research in education. All participants recognized that education could not be identified as being concerned only with pedagogy and that such a narrow view of its scope had, in the past, limited the contribution of educational research. In broader perspective, as an area of systematic enquiries, education is now viewed as a multi-disciplinary field of studies; and, with an increasing concern during the last decade for improving the efficiency of the system of education in each country, as well as for linking education with national development, the contribution of disciplines, outside the traditional faculty of education in the academic domain, has been increasingly recognized. Five years ago, in 1979, at the first of a new series of seminars on research policies initiated by NIER this broadening conception of educational research was brought more sharply into focus.

"Problem-oriented research has to bring together the insights from a variety of disciplines. Interdisciplinary research in education would therefore need to develop appropriate organization forms (team research) as well as research procedures which will ensure bringing together specialists from different related disciplines in a coherent manner. At the institutional level, such team research would call for appropriate procedures for inter-institutional co-operation, and promotion of understanding among research workers drawn from different disciplines. Inter-institutional co-operation is highly important. Such co-operation will be necessary at several levels. In countries where education is in the charge of several ministries, inter-ministerial co-operation would be necessary for educational research. Then co-operation would be necessary among institutions at different levels and jurisdictions, for example, universities, ministries of education, research institutions.

The Seminar was of the view that Unesco and other concerned international organizations could help in promoting educational research by facilitating inter-country exchange of research personnel. The Seminar also stressed the importance of developing and disseminating educational research information, both at the national and international levels."*

Two years later in 1981, this emphasis was reinforced further at another special seminar called to prepare guidelines for the training and development of personnel to implement this renewed effort to advance research and reform.**

During the 1960s – 1970s there was a marked expansion in research activity into educational issues not only in the more affluent countries, but also in many third world countries, where education was contributing very significantly to national development. The massive support for educational research led scholars from many disciplinary areas, outside the traditional field of psychology, to investigate educational problems with vigour and new perspectives. As a consequence, for the first time in its history, educational research has started to have a significant influence. But the 1960s were also marked by the beginning of an epistemological debate in the social and behavioural sciences, perhaps as a reaction to the strident empiricism that had developed in earlier decades. The impact of this debate was felt sharply in such fields as educational research, where workers were drawing on the knowledge and methods of many disciplines in the investigation of educational problems. This intellectual debate reinforced the conclusion that sound enquiry in educational research advances by combining procedures and strategies from different disciplines. The scientific approach, in other words, was seen to be complementary to the anthropological, historical and phenomenological approaches to research.

In the present Seminar, the participants set out to identify the nature of interdisciplinary research in education, and the kinds of difficulties that have usually retarded its development in the countries of the region present at the Seminar. Clearly, the kind and degree of involvement of other scholars, other than those directly concerned with the pedagogical sciences, tends to differ, depending on various factors, such as the team leader, the organizational set-up (governmental or non-governmental), financial resources, the competencies of the research workers in the team, the orientation of research (such as problem-solving, implementation, evaluation, theoretical), and so on.

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* *Educational Research in Relation to Educational Reform in Asia and Oceania.* Unesco/APEID – NIER Seminar Report, Tokyo, NIER, 1979, p. 21

** *Educational Research and Training in Asia and the Pacific.* Report of a Regional Seminar, Tokyo, NIER, 1981, pp. 9-10.

Most commonly, interdisciplinary research involves only one other discipline besides education (e.g. psychology, sociology or economics), and the research is carried out by a person who is competent in one speciality area, but who has some knowledge of another. Generally, the research responsibility is in the hands of a senior educational research worker, assisted by a scholar from another discipline. Ideally, however, interdisciplinary research should grow in the direction of what has been described by Konomu Matsui as "trans-disciplinary research",* in which there is not only a cross-fertilization of ideas, but also a transformation leading to the development of new concepts and methods, and perhaps, ultimately, a new discipline. Between the two stages of development, several other stages may be recognized, depending on the degree and kind of involvement. The participants were in agreement, however, that if a research has to help in the process of linking education to development, it has to become increasingly flexible and adaptable interdisciplinary research, problem-solving research, action research, and participatory research, and so on.

Against this background, the Seminar considered it useful to identify six different types of interdisciplinary research in education:

i) **Type I**: This type occures when the concepts and methods of one other discipline, such as sociology, psychology or economics and so forth are used in educational research, as in the classical and path-breaking research of Robert Havighurst, *Who Shall be Educated*, published in 1944. This is interdisciplinary research in education of the first variety. The illustration of interdisciplinary research given in Mitra's paper** is of this type. The research shows the application of psychological theory and methods in introducing continuous assessment of pupils in schools as a part of educational reform, particularly of examinations in India. The Thai study on teaching models that facilitate the teaching and learning of morality is also an example of Type I, although a multi-disciplinary team guided research.

ii) **Type II**: Quite often, in educational research, instead of the concepts and methods of other disciplines, some of the salient variables of other social sciences, particularly of sociology and economics, are introduced in a multi-variate research design in studying an educational problem.

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* Konomu Matsui *"Zuno-rengo de Shin-Gijutsu Kaihatsu 0"* (Development of New Technologies by Combining Brains), *Voice*. PHP Research Institute, December 1981.

** **Note to readers**: The papers given by participants and referred to in the text from this point onwards have been included in Annex II of this report.

iii) Type III: In this case an inter-action has taken place between education and several other fields of study (psychology, sociology, administration and management, linguistics, and so on), and the participation of other specialists has occured from the formulation of the problem and design to the final report writing stage of research. Clearly this type implies teamwork of a high order. The Korean project "Comprehensive Diagnosis and Prescription for the Korean Education System" outlined by Lee is a case of Type III. The Australian study, "Resource Allocation Policies in the Government School Systems of Australia and New Zealand", presented in the paper of Keeves is also a case of Type III as the study was conducted by a multi-disciplinary research team. The Japanese study "Role of Educational Research in the Reform of Educational System, Contents and Methods", presented in Yamada's paper is another instance, although the author suggests that it was more a case of inter-professional than inter-disciplinary research.

iv) Type IV: In the changing scene of educational development, many new areas of work in the field of education itself have appeard, indicating the interdisciplinary character of the developmental work itself, *e.g.* science education, health education, population education, environmental education, etc. When an educational research is undertaken in any one of those areas of educational development, it may be identified as Type IV interdisciplinary research. The Malaysian project "Preschool Education in Malaysia", outlined in Nor Hayati's paper, is a case of Type IV.

v) Type V: Education is a multi-disciplinary field of work as well as of study. The linkage of education with national development, requires the involvement of specialists from different areas of work and study. Interdisciplinary research in the context of education for development is Type V. The distinction between Type III and Type V lies in the explicitness of the developmental problem for study and action in Type V. The proposal from the Philippines for a study of the "Values of Filipino Women: Their Implications for Education, National Policy and Social Action", as presented by Sutaria, is a case of Type V. It should be noted however that the specialists from other disciplines were involved only in critically examining the research report and in further analysis of data. Indonesian projects, "The Development School Pilot Project" and "The PAMONG Primary School" discussed in Mulyadi's paper are also illustrations of Type V, as the attempt is not only to study but to take action in changing the primary school system so as to make it more relevant for

development.

vi) **Type VI**: Konomu Matsui's last stage of development, called trans-disciplinary, which is quoted in Yamada's paper, may be identified as an unrealized ideal of interdisciplinary research, where disciplines merge into each other giving rise to a new discipline.

It thus appears that interdisciplinary research admits of different shades of meaning. Multi-disciplinary, cross-disciplinary and trans-disciplinary research are all interdisciplinary research. From the illustrations mentioned by the participants in the Seminar, it was evident that interdisciplinary research, while still not well developed yet in many countries of the region, still covers a fairly wide variety of efforts. But there is one thing in common, and that is that the projects all refer to educational reform and are concerned, in one way or the other, with linking education to national development.

Generally, interdisciplinary research also involves participation, but that does not always qualify it to be called participatory research. Participartory research is usually embedded in social action and requires an interdisciplinary approach. Action research, as it has emerged, in recent times, also requires an interdisciplinary approach; it is not just research on classroom practices.

As was stated frequently, research paradigms in education are no longer restricted to the "scientific" and "statistical" methods used in studying educational problems. The model of scientific method based on an emphasis on empirical and quantifiable observations and mathematical-statistical analysis of data has been challenged as the only source of knowledge in education, particularly because praxis is the heart of education. The other paradigms of research are those of anthropology, humanistic psychology, analytical social sciences, etc. Educational development, whether of a system, or of individuals, takes place in given social and cultural contexts, and social action is the wider framework of understanding educational reform and change.

The governments of many countries in the region are concerned about the educational system and social change; and, therefore create the need for interdisciplinary research in education and development. In some countries, however, the initiative for interdisciplinary research in education is largely in the hands of national institutes of educational research and such other organizations, which have their financial support from the government, but have also access to private funds.

B. Conditions for the Development of Interdisciplinary Research in Education

Many countries of the region have experienced difficulties and problems in promoting interdisciplinary research in education. During the course of discussion in the Seminar, the participants mentioned several kinds of difficulties, which retard the progress of interdisciplinary research projects and inhibit the development of interdisciplinary research, in general, within the countries concerned. For purpose of reporting, these difficulties and problems are categorized here as conditions for the development of interdisciplinary research in education.

The first and foremost of the conditions is the availability of funds. In terms of cost, interdisciplinary research tends to be more costly, because it involves a relatively larger number of research workers, and it tends to be wider in scope and size of operations. It was pointed out, during the discussion, that high grade research workers from other disciplines need more money in order to make their participation in an interdisciplinary research attractive enough; otherwise, they would prefer to work in their respective fields of inquiry, where, in view of the prevailing academic tradition and culture, the pay-off from their individual research is higher, in terms of academic recognition and future career prospects. However, in those countries where the research is initiated by the government, or by national organizations, the constraints of funds are relatively less. It was recognized that unless the problem of research itself has priority for reform and improvement of education within a country, financial resources for interdisciplinary research may not be adequate.

Secondly, the Seminar devoted a considerable part of its time in discussing the difficulties and problems in building an effective team of research workers drawn from different disciplines, sometimes from other institutions or departments of the government or universities. It was recognized that there are *"prima donnas"* of research who are difficult to tackle. To find a team leader who will be acceptable to the team is not always easy. A senior person, who may be easily acceptable, may not be readily available, as such persons are few and are very much in demand for their leadership qualities. A team leader should have competence in his/her own field of specialization no doubt, but he/she should have some competence in other fields of work as well, in order to be able to understand and appreciate the points of view which other participating specialists in a research team usually have. The possibility of training a team leader in the organization and management of an interdisciplinary team was also discussed. It is of interest to note that a previous NIER seminar on training of young researchers had given some thought to this problem, and had

recommended that young researchers be exposed to the concepts and methods of research in other disciplines during their training for research in education.

Thirdly, there are difficulties in finding appropriately trained persons for participation in interdisciplinary research in education, because of a lack of sufficient numbers of trained persons not only within education itself, but in other fields, as well. The question of training facilities for interdisciplinary research is not just appropriate for educational research only; it is as much appropriate for social sciences and humanities, where the training in research tends to be exclusively for the discipline itself, as in education. The rigidities in the matter of boundaries of disciplines and faculties in the universities inhibit the development of common programmes of training in research methodology cutting across disciplines. There seems to be a movement in the academic world towards an emphasis on a relatively more generalist approach in the education of a young person in the university, which needs to be strengthened and encouraged by educationists. But educationists themselves are steeped in a pedagogical tradition, which needs to be overcome, when it comes to their training.

Fourthly, another limitation on the development of interdisciplinary research within an institutional setting or in a university department of a social science or education arises from the number of the staff members available from various disciplines. Unless the number is fairly large, it becomes difficult to draw a team together and the choice may be very restricted. Usually, educationists and teachers outnumber the social scientists in an institution. It is necessary to recognize that the number of social scientists may need to be expanded to demonstrate meaningfully that education is a multi-disciplinary field of study.

Fifth, the question of motivation was discussed in the context of setting up an interdisciplinary team. Sometimes, when the staff members of an institution have to work on an interdisciplinary research project, as a matter of duty, it does not lead, automatically, to the kind of involvement that would make the research project interdisciplinary in spirit and action. There are career problems for young persons which arise out of the reward system prevailing in the country concerned and in relation to the recognition given to the contribution of young persons. In some cases, the recognition arising out of publication by a prestigious national body may be an incentive. At other times, the opportunity to work under the supervision of a well-known authority may be an incentive, or the prime motivating factor may be the opportunity to participate in a national endeavour. The role of the team leader in arousing appropriate motivation was considered to be of importance by the participants.

Sixth, participants recognized the scope for interdisciplinary research in education depended upon the appropriateness of the training that the existing research work force had received. In the words of the report of the NIER seminar (1981) on the training of young researchers: "A basic principle in determining the content of training and study courses is to expand the researcher's acquaintance with different fields, disciplines and methods of research while respecting the individual's interests and preferences."*

The Seminar then emphasized the need for developing training programmes specifically for the training and development of young researchers in interdisciplinary research in education. Appropriate programmes for broadening the understanding of relatively senior researchers need to be developed in order to create a climate for better appreciation of the contributions of various disciplines as well as of the practitioners of education to interdisciplinary research in education.

Seventh, one of the problems in the development of interdisciplinary research in education arises out of the fact that research reports are usually lengthy and technical. This may be one of the main reasons for the results of research not being utilized, thereby nullifying the very purpose of research to link education to development. Senior administrators and policy-makers do not have sufficient time to read lengthy research reports, and the language used in them is often too technical for the lay person. To foster a wider support for interdisciplinary research, for funding as well as for action, it is desirable that reports on this mode should be presented in a style which is easy to comprehend.

Communication across the disciplines is difficult enough, if the language is too specialized. Any interdisciplinary research team has to learn to communicate among themselves by accepting the idea that if there is anything worthwhile to communicate, it can be done in a straight forward and relatively simple language. As a basic principle, training has to be given in writing research reports tailored to different kinds of readers, such as the politicians, the administrators, the planners and the teachers.

It is also usually necessary to highlight the findings of research for executive action. Unless reports are written in such a manner that the implications of the findings of research are drawn out into executive action points, they will be ignored. It is too much to expect of busy administrators that they should draw out such implications as well as indicate the action to be taken. But a multiplicity of reports cannot also be expected from a single research project. Therefore, apart from a technical report, the team leader has to exercise his or her judgement

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* *Educational Research and Training in Asia and the Pacific.* op. cit., pp. 31-2.

in writing other versions of any report for the informed public. With the media now available in many countries, it should be possible to communicate, briefly, through the media, the salient aspects of a research project.

Chapter III

IDENTIFYING NEW DIRECTIONS AND EMPHASES IN INTERDISCIPLINARY RESEARCH

A. Common Directions, Needs, Trends and Problems

It was commonly accepted by all participants in this Seminar that the value of research in advancing educational change, or innovation and more effective teaching practices, is now well recognized in Asian and Pacific countries by teachers' organizations, ministries of education and governments. Moreover, governments have come to exercise an increasing influence on the volume, direction and quality of research carried out by institutions supported from public funds.

Ministries of education and other government bodies clearly have a common interest in educational research that is relevant to national policies, and which may facilitate decisions on long-term planning, curriculum reform, language policies, textbook supply and so forth. Given the breadth of the national curriculums now being implemented in the elementary and secondary schools of most nations, it is not surprising that a growing interest schould be expressed in research that bears upon the quality of teaching advanced over all parts of the instructional programme.

In emphasizing the need for new orientations in educational research related to educational reform, the report of the first seminar in the series in 1979*, as has already been noted, drew special attention to the need to broaden the outlook and scope of educational research through inter-ministerial cooperation, inter-institutional collaboration, and inter-disciplinary research. It has also been observed that this emphasis was reinforced in the reports of subsequent seminars, a regional seminar for example, on the training of young educational researchers, held in October-November 1981; and secondly a seminar in November 1982 on the development of research related to the implementation and evaluation of reforms on content and methods.

* *Educational Research in Relation to Educational Reform in Asia and Oceania.* op. cit., p. 21.

In examining the requirements for the improved training and professional development of both new research workers and those already engaged in research for some years, the 1981 seminar was especially concerned with the increasing diversity of the research competencies required, and with the expansion of the areas in which rigorous enquiries would be welcomed. That seminar, moreover, was impressed with obligations originating from the persistent concern in Asian and Pacific countries about the role of the classroom teacher in responding to and in promoting research; and secondly, with the expectation that research could be used to advance qualitative improvements in educational practice. It was much occupied then with practical steps to widen the horizons of researchers, to deepen their specialization, and to increase their capacity to handle responsibility.*

The 1982 seminar, on the other hand, concentrated more attention on the types of research needed for implementing and evaluating changes in teaching content and methods, action research, instrumental research, research for planning, disciplinary research and so on. Its members gave much time to considering the place of research in the comprehensive planning of a particular reform. It is especially interesting that members of that seminar advanced the view that much interdisciplinary research might be required "to determine the nature, the extent, and aetiology of conflicts and resistance to changes among teachers, supervisors, and educational personnel, including administrators, students and perents." That seminar accordingly gave special emphasis to anticipatory and participatory strategies that might enable research to become more effective in advancing reforms from the national or institutional level.**

The present Seminar was more directly concerned with the origins of the recent impetus to interdisciplinary research or for broader and more flexible conceptions of what constitutes relevant research. It recognized that it is not a new phenomenon to have specialists from many disciplines attracted to tasks of advancing educational change or development. Two decades ago for example, many thousands became experts in the technical assistance offered to help with the obligations of educational planning so prominent at that time.

More recently, as more and more countries have achieved universal schooling, a shift has occurred from a preoccupation with quantitative targets to a deepening concern for qualitative improvements. This new emphasis is concentrated not surprisingly on the revision of curriculums

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* *Educational Research and Training in Asia and the Pacific.* op. cit., pp. 9-10 and 29-33.

** *Research and Educational Reform: Problems and Issues and Strategies for Resolving Them.* Report of a Regional Workshop, Tokyo, NIER, 1983, pp. 15-21.

and the upgrading of teaching methods, it becomes expressed increasingly in advocacy for more interdisciplinary research.

Nevertheless, the priorities for research and development, or professional collaboration, differ in time and place. Participants in the Seminar therefore spent some time considering how the interest in fostering more research of an interdisciplinary character varies from one nation to the next, and within different authorities. Much of the present impetus, it was agreed, emanated from anxieties about economic and national development, a deepening concern in Asian countries for social justice and equity, the implications for national unity of linguistic and ethnic diversity, and for a representation in schools of continuing cultural and social traditions.

Much too has arisen, particularly in the 1970's, from new concerns for social welfare and social cohesion, the quality of life and new visions of the "caring community" both through education and within education. New expectations have emerged in recent years in many Asian and Pacific countries around the relationships to be fostered between school and community.

B. Inadequacies and Limitations of Knowledge

Everyone has knowledge about education, even if it only amounts to knowing the name and reputation of the local elementary school, or a knowledge of children's folk-tales or the foreign language lesson on the radio network. The more involved in educational activities people become, as parents, teachers, politicians or administrators, the greater the number of facts and opinions about these activities they come to possess. In most countries of the Asian and Pacific region nowadays, there are hundreds of men and women in universities, research institutes, colleges, in publishing, journalism, radio and television, for whom the production, organization and dissemination of knowledge about education is probably a full-time occupation.

This Seminar recognized then that the results of "sustained systematic enquiries" are only one element in this corpus of knowledge. The ways in which the findings from these enquiries influence the remaining elements of both theoretical and pretheoretical knowledge are as yet little studied or understood in most nations. There is always a possibility that the effect will be over-estimated for theoretical knowledge forms only a small part of what passes for knowledge about education in any society.

It has to be accepted too that the nations of Asia and the Pacific differ widely in their historical and cultural traditions, and in the diversities of language, culture and religion within their boundaries. Similarly, they differ in the respect they have accorded men and women of knowledge,

the standing they have extended to teachers past and present, and the expectations they hold for students and learners in all their diversity. In more recent times, the systems of compulsory and universal schooling that they are evolving have reached widely spaced phases on any historical scale. There is scope for debate then on the research styles or practices that may be appropriate at different stages in the history of each nation.

There was agreement in the Seminar, however, that in the contemporary scene the knowledge and information available to curriculum development teams, to those who plan new teaching programmes or develop new textbooks, often reflects inadequately the issues of social justice and equity which arise in modern nations. Most are still groping to understand at the same time the new alternatives for learning outside the school created by present-day technological achievements. It quickly became evident that the countries of the region differ widely in the extent to which academic studies in universities predominate in the total volume of research undertaken. Universities in most countries are concerned with basic theoretical studies, with reflection on educational philosophies or with historical and comparative studies. These interests do not always coincide neatly with the obligations placed upon administrative authorities to evolve new curriculums for, say, health education or an integrated science programme, or a sequential syllabus in music education to be implemented in elementary or secondary schools and so on.

The most pervasive pressure for revising curriculums or for the reshaping of expectations about life-long learning or for reconsidering the scope for instruction beyond the conventional school room originates from the impressive achievements and potential of science and technology in modern times. The technology that now surfaces most frequently in discussions of the future of education is incorporated in a number of developments collectively known as the new information technology. The two main components of this technology are: i) computer technology, concerned with the storing and rearrangement of information, and ii) communication technology, concerned with the transmission of information by means of coaxial cables, wave guides, optical fibres and satellites. It is the capacity of these technologies to affect so many aspects of life – home, job and recreation – that has produced the popular talk of revolution, of "global" villages and of future shock. It was recognized by the Seminar that this new information technology already has the capacity to transform education, its content, its methods and its location. In adding to the multi-disciplinary emphasis, it is already clear that it is not a single technology that will have applications in the future, but rather several different kinds of technology, used in combination with each other. The teaching profession of most nations in the Asian and Pacific region readily

admits that its knowledge of the implications of this prospect is far from complete.

C. Formulating a Vision for Action

The Seminar appreciated that the record of the impact of multi- or interdisciplinary research on educational policies or practices has so far been modest in almost all countries. Indeed a similar conclusion might apply to educational research as a whole. The notion of policy-oriented studies, to give one example, has been discussed widely, in recent years, in Western countries. To date, however, few studies have managed to provide the kind of information on alternative courses of action that is required for rational decision-making.

For the most part, in most countries, the influence of educational research has been to sensitize, to create a more discriminating professional alertness. It has indicated the importance of certain problems and the danger of the unselfconscious use of certain procedures, without necessarily providing clear-cut calculations of advantage or a firm foundation for policy decisions. At best, and for committed governments, the outcomes of educational research in modern times has provided guidance on occasions which has had programmatic value. The general conclusions of accumulated studies have helped to delineate broad fields where more precise formulations can be advanced. They have provided approaches to the interpretation of evidence that can be used to test more precise theories and assumptions. They have helped teachers and observers become more alert to the kind of factors that are relevant in explaining a given trend or an unforeseen phenomenon. But it can not be claimed yet, that educational research invariably reaches even these modest levels of relevance in all countries of the Asian and Pacific region. And inter-disciplinary research, in particular, has still to demonstrate its value and special significance in assisting educational authorities to cope with the complexities of the present world.

Members of this Seminar were impressed with the importance of anticipatory research as a basis for the decisions that lie ahead in helping school systems to cope with remarkable advances in the technology of communication, with the implications of increasing numbers of older citizens in each nation, and with the impressive changes occurring in the occupational structures of particular nations. It was also recognized that these obligations were introducing new requirements for collaboration among the agencies of government, as well as new opportunities for coordinated planning with the productive and service sections of the economic order in each nation.

It was also accepted that educational research is cosmopolitan in scope. In advancing the confidence and competence of research workers as well as the teaching professions they serve, provisions have to be made for them to keep abreast of the world-wide search for better knowledge and deeper understandings. Publishing and the transmission of knowledge by modern telecommunications is a world-wide activity and greatly influences the attitudes and values adopted by young people. Those who sponsor or administer research programmes need to be clear about the impact of these influences on the knowledge they seek to disseminate, and hope to use effectively. The findings and conclusions of interdisciplinary research, or any other form of educational research for that matter, will have to compete in the future with many other forms of knowledge available to those who shape the educational policies of most nations.

The experience of nations where research has been advanced in a spirit of innovation suggests that it is especially important in seeking the collaboration of scholars of different disciplines to be quite clear about the outcomes to be provided for in planning. For collaboration to be effective, scholars from different fields require a consistent intellectual perspective in clarifying national or theoretical aspirations. It was also considered to be helpful, if scholars can be encouraged to foresee the problems expected in an area of widespread public concern.

The Seminar was persuaded that when these conditions are fulfilled the senior scholars of particular specialities are less preoccupied with material gain as a price for their collaboration.

D. Promoting Cooperation, Communication and Community Support

By its nature, educational research is always concerned with communication and the success with which teachers, or administrators and others understand the observations produced. Those concerned with the promotion of interdisciplinary research need to give special attention to the obligations imposed both by the diversity of agencies and interests involved in advancing the need for such a broader conception of research, as well as to the particular tasks that arise in communicating between scholars from particular disciplines. It was generally agreed that the more serious and distinctive issues of communication originate from the obligation to stimulate effective appreciation and clarification among the specialities involved.

It was also recognized that governments are usually anxious to ensure that their investment in research should lead to improvements in teaching or administrative practices through effective dissemination, advisory or consultative services and adequate coordination between the agencies

involved. This emphasis on coordination and collaboration finds further expression in the opportunities that have arisen for nations to join together in tackling common problems of planning or curriculum development. For the most part, this broader collaborative effort in Asian and Pacific countries has been encouraged by organizations such as Unesco, UNICEF, UNDP and the World Bank. Significantly, a number of the innovative projects initiated by Unesco in different countries over the years have brought about collaboration between government and non-government research institutions. These international activities have again reaffirmed the importance of national centres for research information in each nation in promoting professional collaboration at an international level among scholars concerned with the broader conceptions of educational research with which this Seminar has been concerned.

Chapter IV

STRATEGIES AND GUIDELINES FOR THE ADVANCEMENT OF INTERDISCIPLINARY RESEARCH IN EDUCATION

Having reviewed the experience of each nation in advancing interdisciplinary approaches to research in education, and identified common directions, needs and problems, participants in the Seminar agreed that the following observations should be taken into account in creating favourable conditions for this mode of research.

A. General Considerations

Objectives

1. The Seminar recognized the need for clarifying the objectives of interdisciplinary research in education, in order to create a climate for its acceptance as a mechanism for problem-solving in education, thereby enhancing the capacity of a country in responding meaningfully to the demands for educational reform related to its social and economic development. It is necessary to recognize the importance of interdisciplinary research in clarifying the complexity of educational issues, which are enmeshed in the socio-cultural matrix of each country.

2. Since one of the purposes of interdisciplinary research is to assist with the formulation and evaluation of policy, there are advantages in spelling out its implications in this regard. The impact of science and technology in the countries of the region raises difficult questions regarding the future characteristics of industry, agriculture, health, transport and communications, and the profile of man-power requirements in each case. Questions of educational policy as well as of further training of man-power are involved.

3. It is necessary to acknowledge that interdisciplinary research in education requires the effective use of both the scientific and humanistic paradigms of research, rather than the exclusive use of only one paradigm. A perspective understanding of the educational processes in a country may come from those who are not, strictly speaking, research workers, and interdisciplinary research should not exclude such understandings. There are persons in a country, who are concerned more with social action, than with knowledge *per se*, and interdisciplinary research should profit from their involvement.

4. The notion that interdisciplinary research can advance only at the cost of each discipline needs to be dispelled. It should be recognized that advances in research commonly occur at the boundaries between two disciplines, such that these developments contribute to the development of each discipline involved in interdisciplinary research.

Selection of Problem

1. Interdisciplinary research in the context of educational reform for national development, should study problems of significance to the nation. Not that interdisciplinary research can not be engaged in pure academic pursuits, but, considering its state of development in the region, it is better, as a strategy, to concentrate on problem-solving, rather than theory-building. If the problems are not of wider significance to the country, it may be difficult to attract funds as well as experts from other disciplines.

2. There should be an emphasis on the intellectual quality and relevance to educational practice in the choice of problems for study in interdisciplinary research.

Organization and Management

1. It is not easy to build an interdisciplinary team, and after getting together a team, it is not a simple matter to keep them together and to lead them on to devoted work. It is necessary to select a leader of the team, whose standing in his/her area of work is, more or less, well-known not only within the country, but, sometimes even outside the country. In other words, the project leaders should be of good professional standing.

2. The team leader is under an obligation to create an intellectual and professional climate that respects and accepts the concepts and contributions of numerous disciplines in the resolution of educational issues.

3. A climate of working together has to be created. Each member of the research team needs an understanding of the process of choosing the priorities and directions of interdisciplinary research (in relation to other research obligations) and the key social and/or educational problem to be resolved.

4. Where national research bodies, or government departments of education are concerned with interdisciplinary research, it may be necessary to examine the appropriateness, or otherwise, of the organizational structures and climate in fostering interdisciplinary research.

Utilization of the Results of Research

Most educational research findings are not utilized adequately. If interdisciplinary research is to grow, it must be saved from the frustration of not seeing the results being utilized for educational development. It is, therefore, necessary to devise appropriate strategies and organizational structures, which would help in utilization of the research results. One way of ensuring this is to involve leading administrators, policy-makers and such other persons in an advisory committee for an interdisciplinary research project. Another complementary strategy is to, periodically, bring such people into discussions of the on-going research. Finally, at the end of a research enquiry, when findings are available, their public acceptance may be initiated at special occasions for teachers, print and broadcast journalists and the general public.

B. Considerations for the Training, Recruitment and Development of Research Staff and Advisory Networks

Throughout the discussions of the Seminar references were made to the need to develop a professional outlook which appreciates the growing importance of interdisciplinary research, and helps to prepare personnel capable of implementing its promise. Accordingly, the Seminar discussed the following provisions as a means toward helping such an outlook to develop. It urges that consideration be given to:

1. The role of advisory panels of experts chosen on an interdisciplinary basis (and when feasible on an international basis) in providing a reference group for the project staff to consult on the aims and procedures being used for a major investigation.

2. The importance of field experience in a variety of educational settings as a basis for developing special talents to be used in interdisciplinary research.

3. The advantages to be gained from collaboration between institutions and countries in providing experiences in research management related to the organizing, and coordinating of interdisciplinary projects.

4. The prospects for the development of modular courses and proto-type materials and other aids of this kind.

5. The advantages to be gained from establishing research fellowships or internships, and other similar awards. It is assumed that such short-term appointments will become a means of attracting imaginative proposals.

6. The likely interest in and the additional provisions for courses providing an appreciation of the conceptual and methodological procedures adopted by the major social sciences.

7. The identification of major undertakings (*e.g.* computer education, moral education, national language policies or the role of examinations, etc.) for which regional cooperation would be especially promising in clarifying the complexity and promise of particular topics.

C. Prospects for Cooperative Publishing and Dissemination

There was also common agreement that the publication, dissemination and utilization of the outcomes of interdisciplinary research was a special obligation, and hopes were expressed that opportunities for cooperative publishing and dissemination would expand in the years ahead. In the meantime, as steps toward that objective, it was proposed that:

1. Research institutes, ministries and other bodies should be encouraged to exchange newsletters, periodicals and publications with other institutes represented in the Associated Centres of the APEID network.

2. National research organizations in the region, and also regional centres should be encouraged to take clearing house functions in assembling reports and library documentation on research outcomes in participating countries.

3. The prospects for collaborative publishing between national research institutes should be examined with a view toward creating more partnerships in disseminating research findings.

4. The publication of condensed editions of reports on interdisciplinary research and scholarship should be encouraged, and the possibilities of regional seminars to present the findings of major interdisciplinary projects should be examined.

5. The NIER report in English entitled "Dissemination and Utilization of Educational Research" should be brought to the attention of all participants and their employing authorities with a request that its recommendations be given very careful consideration.

Annex I

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Annex II

INDIVIDUAL PAPERS

INTERDISCIPLINARY RESEARCH IN EDUCATION IN AUSTRALIA

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Australia

Introduction

Two key characteristics of educational research can be identified. The first characteristic of research into educational problems is the multidisciplinary nature of the activity. It is no longer acceptable to advance the claim that educational research should command a discipline of its own forming a field of educational or pedagogical science. The developments that have occurred during the past two decades have taken place as a result of thinking about educational problems from the perspectives of the social sciences (sociology, economics, demography, political science) and the humanities (philosophy, history, anthropology and linguistics) as well as the traditional field of the behavioural sciences, which includes the many branches of psychology. Each area, it must be argued, can contribute to the examination of educational questions. Furthermore, it could be suggested that perhaps the most valuable advances occur at the borders between two or more disciplines. In addition, it must be recognized that educational problems which warrant investigation and for which solutions must be sought, are not simply those that occur in the classroom. Education takes place not only in schools but also within the home, the peer group, and through the mass media, in libraries and museums, at work and at play. The multifaceted nature of education

means that there is a wide variety of groups to whom the findings of educational research are of concern. Contributions to the resolution of their problems can be obtained from the cumulative bodies of knowledge which have been built up in many major disciplinary areas.

The second key characteristic of educational research is that it must deal with complex relationships involving many variables that are operating simultaneously. It is rare that a worthwhile investigation of an educational problem can be reduced to an examination of the relationship between only two variables. One of the strategies that is commonly employed to examine the simultaneous action of many variables is to undertake intensive case studies of a situation in which many factors are at work and to report in detail the full complexity and circumstances of the events observed. This approach is admirable if it contributes to the accumulation of a body of knowledge about education through the understandings that are achieved. However, if the case study is idiosyncratic and unique it will add little. Consequently, there is a move to undertake multi-site studies and to derive generalizations from the many studies that will form the basis of 'grounded' theories. An alternative strategy involves the use of high-speed computers to analyse simultaneously considerable bodies of data which contain many variables. Because of the capabilities of computers using a range of analytical techniques to undertake the statistical control of specific factors in the analysis of data, it is no longer essential to design an experiment, as is characteristic of much psychological research, and so to remove the effects of many intervening variables by randomization procedures. The educational research worker is rarely able to design an appropriate experiment because it frequently involves interfering in the lives of people. The alternative that has emerged is to develop a complex multivariate statistical model and to test the structure of the model and then to estimate its parameters through the statistical control of variables rather than through random allocation. Nevertheless, it must be acknowledged that a truly experimental approach, if it were a practicable alternative, would provide more soundly based conclusions than could be obtained from a non-experimental study in a natural situation.

It is evident that from the mid-1960s the advent of the computer has had a significant influence on educational research. Data processing and data analysis have no longer been limited by computation time. However, the 1960s also marked the beginning of an epistemological debate both in educational research and in the social sciences. This debate was possibly a reaction to the over-emphasis on scientific empiricism that was endorsed by many research workers particularly those who relied heavily on computer analyses. As a consequence, there has developed something

of a conflict between the two major paradigms that are employed in the investigation of educational problems. One paradigm is based on the approach of the natural sciences and emphasizes empirical and quantifiable observations which can be analysed by rigorous mathematical procedures. The task of research is to develop causal relationships and explanations. The alternative paradigm is concerned with humanistic studies, and is derived in the main from philosophy, history and anthropology. This paradigm emphasizes qualitative information and the building of an interpretation and understanding of events. With the expansion of educational research which has taken place in Australia, as elsewhere in the world since the mid-1960s, both paradigms have gained strength. Clearly the answer for educational researchers in the years ahead is not to advocate the use of one paradigm or the other but to seek to employ both as is appropriate. It has come to be recognized that sound inquiry in educational research advances in an upward spiral way by combining methods and procedures from different disciplines. The scientific or strongly empirical approach is seen to be complementary to the anthropological, ethnographic and case study approaches.

There is also a further paradigm emerging in the field of educational research that draws on the disciplines of the social sciences, the humanities and the behavioural sciences as well as on the strategies employed within both scientific and humanistic approaches to investigation. This paradigm is concerned with the evaluation of policies and practices in order to improve the conduct of education (Scriven, 1983). The origins of this emphasis on evaluation lie in the need for accountability of the very extensive human and financial resources used in education. There is concern in evaluation studies not only for the effectiveness of the administrative procedures which are employed but also for the effectiveness of the teaching and learning that takes place in educational institutions. Allied to this field of investigation involving evaluation is an area of research in education known as 'action research', which was advanced in the United States in the mid-1950s and that sought to encourage educational practitioners to examine critically and systematically with hard data the effects of their teaching practices. More recently, this approach has been extended to include a wider range of methods of investigation and to involve the professional research worker in education more heavily as a facilitator, but in a participatory and democratic way, in the examination of educational practice, leading to innovation and, hopefully, improvement. Such an approach has considerable appeal to the educational researcher because it is perceived to involve working closely with teachers and schools and undertaking research that is clearly allied to the immediate needs of teachers. However, the major deficiency of such work, if it were to remain

the only activity in which educational research workers engaged as Scriven (1983) has suggested, would be that while it was effecting change in one institution with respect to one area of praxis it would not be contributing to the building up of a substantial body of knowledge and understanding about the educational process. In the long term educational research would become moribund because it would yield neither theories nor general principles on which it would be possible to draw for the investigation of the major problems that confronted education. It might be argued that such knowledge would reside in the many disciplines that have already been identified as contributing to the study of educational questions. However, educational research is seen to be a separate domain of inquiry that is multi-disciplinary and that seeks to provide a greater understanding and a stronger explanation of the world of educational activity.

The Current Status of Interdisciplinary Research in Australia

The period from 1971 to 1981 saw a marked expansion and development in educational research activity in Australia. As a consequence of the expansion that occurred and the increased funding that was available for educational research, scholars from the social sciences, the humanities and the behavioural sciences were drawn into working on the investigation of educational problems and into occupying positions within institutions in which educational research was being conducted. However, broadening the disciplinary base of those engaged in educational research activity does not of itself lead to the undertaking of interdisciplinary research, but it is a necessary precondition for interdisciplinary research. Without scholars from a range of disciplines, available and interested in the problems of education, it is not possible to establish interdisciplinary teams. The other precondition is almost certainly adequate funding to enable teams of at least two or three research workers to be brought together to investigate a significant problem. The Education Research and Development Committee sought to promote such interdisciplinary activity in the seminars that it held, in the priority areas that it named, and in the projects that it supported.

Educational research in Australia has suffered some severe set backs since 1981. The Education Research Unit at the Australian National University has been closed, and several similar research units in other universities have suffered a corresponding fate. The Education Research and Development Committee was terminated in 1981, and with it went the major source of funding, other than for evaluation projects, for studies into educational problems. In addition, the Research Sections of the State and Territorial Education Departments, where research of quality

was beginning to take place were either closed, or greatly reduced in size. Nevertheless, one or two very active sections remain. The need for interdisciplinary research in Australian education is recognized but the circumstances are such that it will, in general, only be through the isolated and chance event of individuals continuing to work together on the investigation of a common problem within a university, an education department or in research institutes that any significant interdisciplinary study could be carried out within Australia at the present time.

An Example of Interdisciplinary Research

Perhaps the most substantial interdisciplinary study that has been undertaken in the field of education in Australia has been the study of 'Resource Allocation Policies in the Government School Systems of Australia and New Zealand'. This study was undertaken by a team of research workers at the Australian Council for Educational Research and was funded by the Australian Education Council (a Council of Ministers of Education of Australia and New Zealand) and the Australian Council for Educational Research. The study started in 1979 and the reports were published in 1982. The team assembled to work on this study comprised a person with a background in comparative education with a strong interest at that time in organizational and policy issues, a person skilled in evaluation studies in education, a person with a background in the sociology of organizations, and an economist with an interest in micro-economic problems and labour market research. The team worked together over a period of about two and a half years to undertake the study and prepare the reports for publication (see Ainley, Keeves, McKenzie and Sturman, 1982).

In designing and conducting the study most emphasis was placed on personnel rather than material resources, which reflected both the emphasis in the terms of reference and the relative proportions of the education budget spent in the two areas. Implicit in the terms of reference was the idea of allocation of resources at two levels: from the system to and between the schools, and within schools. The information at the system level concerned with the allocation of staffing and resources to and between schools was largely provided by a series of system case study reports produced by each of the educational authorities involved in the study. Using the individual reports from each system as a basis, a comparative analysis was undertaken and has been reported by McKenzie and Keeves (1982). The second level of resource allocation was concerned with staffing and resource policy decisions within schools. At this level of the study two approaches were used: a survey of a sample of schools, and a

series of case studies in 16 specially selected schools. The survey was designed to map the diversity of school responses to questions of resource allocation across the government schools of Australia and New Zealand. Both primary and secondary schools were asked about the resource allocation problems that they faced and policies and practices developed in response to these problems. The results of the survey have been reported by Ainley (1982). In the case study phase of the investigation schools were selected from a range of locations, types, sizes and staffing structures in order to:

1. elucidate staffing processes described in the survey;
2. analyse in detail special innovative features of the schools in order to judge their general value to other schools in allocating resources or developing organizational structures; and
3. study the effects of constraints such as school size, type of enrolment and system policies in these schools.

The observations made in the case study schools have been collected and synthesized by Sturman (1982). The case studies in schools and the survey of schools were seen to be complementary to each other in providing to the school systems information about school responses to system policies.

The nature of this investigation required a range of skills and disciplinary backgrounds of the members of the team who were brought together for the study. The system level report demanded a combination of skills in the examination of policy issues, of demographic trends and of the costs, and cost-benefits of alternative resource allocation policies and practices. The survey of schools required experience in evaluation and a background understanding of the use of staff and facilities by schools. The intensive case studies of the schools and their organization required a person with a background in organizational sociology and with an interest in policy oriented research. It was indeed fortuitous that a lead time of nearly 12 months was available to assemble a team with the necessary skills to undertake the study.

Prospects for the Future Interdisciplinary Research in Education in Australia

In examining the prospects for the future of interdisciplinary research in education in Australia there are three aspects to be considered. The first aspect is concerned with *capacity*, or the availability of research workers in sufficient numbers and drawn from the full range of disciplines for interdisciplinary teams to be assembled. Secondly, there is the aspect concerned with *opportunity*, which would require that research workers

drawn from different disciplinary areas were working in the same or adjacent institutions to enable an interdisciplinary team to be formed. Thirdly, there is the question of whether there is an *incentive* including financial support for an interdisciplinary team to be formed to investigate a problem that requires an approach from more than one disciplinary perspective.

Capacity: Over the period from 1971 to 1981, as previously discussed, there was a marked growth in the conduct of educational research in Australia. Associated with this growth was an approximately seven-fold increase in the number of research workers trained for the study of educational problems through masters or doctoral degree programmes in Australian universities. The number of higher degrees awarded in education increased from 65 in 1971 to 457 by 1981. To these must be added a group of unknown size who have received training overseas, primarily in the United States, Britain and Canada. These persons, generally speaking, have come from a range of disciplines and have greatly increased the capacity within Australia for research to be undertaken that draws on a variety of disciplines. At the present time there would appear to be a deficiency in the supply of research workers trained in the disciplines of economics, demography, and law. Moreover, there would appear to have been a relative decline in the numbers trained in the sophisticated skills of measurement and statistical analysis, although tangible evidence is not immediately available to support these claims.

Opportunity: In order for there to be sufficient opportunity to facilitate the setting up of interdisciplinary teams, it would appear to be necessary to have substantial numbers from different disciplines working side by side. The size of staff of an institution which would be large enough to support an interdisciplinary team is not known. However, it is evident that of the 17 universities with schools of education, only perhaps five are really large enough to have an adequate number of staff working side by side to establish an interdisciplinary approach to educational problems. Likewise of the State and Territorial Departments of Education, it would seem likely that only one is strong enough and large enough to set up an interdisciplinary team. Among the research institutes, only the Australian Council for Educational Research and the Institute of Family Studies are of sufficient size and strength to establish interdisciplinary teams. Nonetheless, the ACER has found it increasingly difficult to sustain a team approach to educational research in the face of the number of urgent problems that need attention, and to which the ACER is in a position to make an effective contribution. However, this is more a question of policy than a lack of opportunity.

Incentive: It is evident that the major shortcoming in the Australian setting is that of incentive. In part, there is a lack of general recognition that there are substantial problems of a non-evaluative kind that could be tackled by an interdisciplinary team and would provide significant advances in the understanding of a problem situation. As a consequence, funding for educational research is very uncertain, and where funding is made available it is provided for evaluation studies or for innovation studies rather than for research activity. In the absence of adequate funding it would be extremely difficult to establish and maintain over a period of several years a sizable interdisciplinary team, in order for that team to undertake a substantial interdisciplinary research programme.

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EDUCATIONAL REFORM AND INTERDISCIPLINARY RESEARCH IN EDUCATION IN CHINA

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Introduction

Now, in China, an educational reform campaign is developing throughout the country. It has become more vigorous ever since Deng Xiaoping, one of our top leaders, advocated, "Education should serve the modernization programme, look into the rest of the world, and cater for the future." The dimensions of the reform include elementary education, secondary education, higher education, vocational education, adult education, and so on. And it aims not only at the school systems, but at educational content and methods as well. Thus, it may be safe to regard it as a comprehensive or multi-sided educational reform.

Local governmental departments concerned and schools of all types are being motivated and encouraged to conduct various innovative experiments of their own accord, while the campaign is being unfolded step by step in a planned way under the leadership of the Ministry of Education. Consequently, the initiatives of the leadership and rank and file are being brought into play, and zeal for educational reform and innovation is whipped up in different parts of the country and in schools of all types.

In short, the current situation in China is favourable to educational reform. It is the "spring for educational reform" now, as a saying goes. And it is well said, for it has a dual meaning : the reform of education has begun with great vitality, but it is just a new beginning after all. As the educational reform campaign develops, the role of educational research is found to be more indispensable. And just because the current reform campaign is comprehensive and multi-dimensional, interdisciplinary research in education is the more imperative and important.

An Example of Interdisciplinary Research

With regard to interdisciplinary research in education, no more than preliminary endeavours have been made in this field in China. But a project in which I am engaged may be considered as an example of interdisciplinary research in education. The project is entitled "investigation and study of instructional reforms and experiments in elementary and secondary schools".

The topic is originated from the fact that diverse reforms and experiments, either comprehensive or single course centered, are being attempted in many of our elementary and secondary schools. For instance, a variety of endeavours are being made at improving instructions of Chinese, math and science both at the elementary and secondary levels. How are the reform and innovative activities getting on? What results have been scored? What is left to be desired? What components of elementary and secondary education have to be renewed or remolded? And what are the interrelations between these components? Lots of problems remain to be studied. And the study has to be synthetic, comprehensive and interdisciplinary rather than single subject research. Or more exactly, a synthetic, comprehensive and interdisciplinary research should be integrated with single subject studies. Only that way, it will be possible to provide constructive suggestions and recommendations to guide instructional reforms and innovations in elementary and secondary schools, which is the very goal of the implementation of the project.

The main concerns of the project are as follows.

1. *School system:* At present, two school systems are available in our elementary education, one of five years, the other of six years. The case is the same with secondary education, namely, three years for lower secondary, two or three years for upper secondary. Besides, some educators advocate a 5-4-3 year system, namely, five years for elementary, four years for lower secondary, and three years for upper secondary. What are the strong points and weak points of the different systems? How can our elementary and secondary school systems be rendered more adaptable to the situation in our country and be better geared to the needs of the modernization programme? These are the very problems to be studied.

2. *Curriculum:* Curriculum is tightly tied with school system. And elementary curriculum is closely related with secondary curriculum. What is more, curriculum is involved in the relationship between school education and science and technology which is developing rapidly, in the relationship between general education and vocational education, and in the relationship between different disciplines. And the problem of "separation" or "unification" exists in some curriculum offerings. To cite an example, science is instructed in separate subjects such as physics, chemistry, biology, etc., in China, while it is offered as one subject in some other countries. Which choice is better? It is also worth studying.

3. *Instructional material:* Instructional materials also have much to do with curriculum, and with the rapid development of science and technology as well. The reform of instructional materials has relevance

to the determination of each subject matter, and the composition of textbooks in each subject, and needless to say, the relations between different subject matters as well.

4. *Teaching method:* Teaching method is an important component of common concern in our elementary and secondary instructional reform, a component on which there has been much discussion and argument and at which diverse reform endeavours have been made. Involved in the reform of teaching methods are problems shared by all subjects as well as specific problems of different subjects.

5. *Interrelationships:* The relationship between elementary and secondary education on one hand and productive labour and vocational education on the other, and the relationship between classroom instruction and complementary activities out of classroom, are also areas of our interest in the elementary and secondary instructional reform. In recent years, some localities and schools have attached great importance to conducting various educational and instructional complementary activities out of classroom in a planned way. They regard it as developing a "second classroom" or a "second channel" of instruction.

But on the interrelated aspects mentioned above, there used to be far more separate studies than comprehensive ones. The case was the same even with studies on curriculum and teaching materials. However, a comprehensive study or research is out of question until cooperative efforts are made jointly by a large number of research and educational institutions, and research workers and educators.

The project mentioned here is conducted by a research team consisted of personnel mainly from three institutions: Beijing Normal University, the Research Institute for Curriculum and Instructional Materials, and the Central Institute of Educational Research. We enjoy support from some other organizations which participate in our activities as our collaborators and associates. The major ones are:

1) Educational departments or institutes for educational research at the provincial level;
2) Associations for instructions of different school subjects such as Chinese, math, physics, chemistry, biology, history, geography and foreign languages, under the Educational Society of China; and
3) Some experimental schools involved and schools which are doing creative jobs in instructional reform.

Further, we maintain close ties with organizations engaged in projects and research activities relevant to our project such as those concerning educational economics, rural education and pre-school education in order

that we may coordinate our actions.

The project began at the beginning of this year, and a preliminary report is supposed to be worked out by the end of 1985, so as to provide constructive suggestions as the basis of the further reform of our school education during the period of the seventh five-year plan to be carried out from 1986, and lay a foundation for more thoroughgoing and in-depth research of the reform of our elementary and secondary education. In a word, it is a long-term rather than short-term project, a complex project made up of different strata and different components rather than a single-element project, and thus may be regarded as an interdisciplinary project.

Conclusions

Such a project, its contents and organizational work being complicated, is unlikely to be conducted smoothly without making painstaking efforts. But I do feel optimistic about the success of the project, and about the prospects of educational reform and educational research in China, for my country now pays close attention to education, educational reform and educational research, and educational departments at all levels and many schools in China are enthusiastic about educational reform and educational research. The continuous development of interdisciplinary research is out of question, I believe.

Educators and educational research workers in China have a glorious future while confronted with many new challenges. We are ready to learn from other countries, and wish to discuss issues and problems concerning educational reform and educational research with educators from various countries for the development of education and educational reform.

INTERDISCIPLINARY RESEARCH IN EDUCATION IN INDIA: STATUS AND PROSPECTS

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India

The Meaning of Interdisciplinary Research in Education

1. It is necessary to clarify the meaning of interdisciplinary research in education, because educational research usually involves the theories and insights as well as methodology of a discipline other than education. A large bulk of educational research involves education and one other discipline, usually psychology, because the process of education is largely psychological.

2. Gage in his *Handbook of Research on Teaching* distinguishes among three broad categories of variables in educational research: presage, process and product variables. Presage variables are usually the background variables, among which are included sociological and economic variables. Process variables include psychological variables. Product variables may be immediately observable or remotely. In the latter case, sociological and economic variables are included. Thus, in a research design, besides educational variables, psychological, sociological, economic and other variables may be included. Usually, the educational variables are treated as dependent variables.

3. The question is: whether interdisciplinary research in education means more than the use of concepts and methods of a discipline other than education, or the use of variables from other disciplines in the design of educational research?

4. Quite often, the words 'multi-disciplinary research' are used, almost interchangeably with 'interdisciplinary research'. But the two have somewhat different connotation. Multi-disciplinary research in education should mean the involvement of a number of disciplines, simultaneously in studying an educational problem, from the points of view of different disciplines. Interdisciplinary research means that there should be interaction among different disciplines, which subsumes the simultaneity of multi-disciplinary research. In other words, there can be research with or without interaction, and the thin line which separates interdisciplinary from multi-disciplinary depends on whether it is with or without interaction. Interaction requires that there be processes of influence both ways, as in chemical reaction or in social interaction. Thus, interdisciplinary research in education should require an interaction among

educational scientists and other scientists involved in a study, and among the sciences involved as well. Only the provision of statistical "interaction" of variables in a research design is not enough for a research to qualify as interdisciplinary. On the other hand, a cross-fertilisation of ideas across disciplines is a serious limiting condition for interdisciplinary research in education. Considering the communication and interpersonal problems involved in interaction, it seems that multi-disciplinary research offers greater possibilities. It should be sufficient, if an educational problem is looked at from the point of view of another discipline, with or without interaction among the scientists from different disciplines. The important distinguishing characteristic of interdisciplinary research in education is that such research should use the knowledge, concepts, methods and insights of a discipline other than education.

5. Of late, some new areas of work have emerged in education which, on the face of it, show an interdisciplinary character, e.g., science education, health education, population education, environmental education, and the like. Work in these areas require interaction of education with other sciences. Surely, interdisciplinary research in education cannot be limited to these areas of education only.

6. Our analysis so far indicates the following types of interdisciplinary research in education:

(a) *Type I research* is where the concepts and methods of another discipline are used in studying an educational problem.

(b) *Type II research* is where the variables of another discipline are included a multi-variate research design in studying an educational problem.

(c) *Type III research* is where more than one discipline interact throughout all the phases of a research in education, involving even, at times (mercifully), inter-personal influences among scientists of different disciplines.

(d) *Type IV research* is research in an interdisciplinary area of education, like science education.

It is not, however, a true typology, because more often than not, an interdisciplinary research in education is a mixed variety. It is a matter of degree as to how much of anothr discipline is allowed to influence research on educational problems, because those who have studied education as a discipline consider, and sometimes rightly, that experts in other disciplines may not grasp fully the significance of an educational problem, in all its ramifications and depth.

7. However, there seems to be another sense in which the words interdisciplinary research in education are used. Education is not just a discipline, it is a system in operation in a country; it is an area of development of a nation, like other areas of development, such as economic, social, cultural, health, etc. Education as an area of development makes it immediately relevant for many disciplines, including education, to undertake research. Like, for instance, agriculture, industry, health and communication, education has also material, social, cultural, economic, psychological, organizational, administrative, and evaluative aspects, and therefore, it admits of educational research involving several disciplines in solving educational problems related to development. Further, education for the development of a country requires a linkage of education with socio-economic development, and therefore, developmental education, like developmental economics, has become important in the contemporary scene in the region, and the need for interdisciplinary research in education for development has been felt. Interdisciplinary research in education, in this context, shall we say, *Type V*, is a modality of linking education with development. Thus, the problem of girl's education, for instance, in many countries in the region requires an interdisciplinary approach, because there are social, economic, cultural as well as psychological factors which retard the progress of girl's education. As a matter of fact, girl's education in a traditional society is a threat to the established order, and is not a mere pedagogic issue, or a question of finding more women teachers, or of establishing more schools for girls, etc.

The Trend of Interdisciplinary Research in India

8. The development of interdisciplinary research in education in India has been largely influenced by educational reform and NCERT. Educational reform was initiated soon after the end of colonial rule in India in 1947. Educational reform led to development of educational research, and NCERT came into existence in 1961. In 1964, the Govt. of India appointed an Education Commission with Dr. D.S. Kothari as its Chairman. The report of the Education Commission (1964-1966) recommended far reaching changes in the entire system of education in the country. The Education Commission framed their recommendations in the context of education for national development. A large scale reform in education started soon thereafter. The educational research, at the time of the Education Commission was pitifully small in quantity, and the university departments of education were overburdened with teaching and the bulk of research was what the pupil-teachers did as a part of their training. The concept of developmental research was not clear at that

time. R and D in education, even in the advanced countries of the West, became significant only after the surprise given by the Sputnik in the sky. In India, it was the Govt. of India's Policy Resolution adopted in 1968, accepting the major recommendations of the Education Commission, which gave the necessary push required by the NCERT to go in for a large effort in R and D in education.

9. NCERT initiated studies in the sociology of education in the early sixties. A group of sociologists under the chairmanship of Dr. M.S. Gore conducted statewise studies as well as all-India study indicating for the first time the sociological characteristics of Indian education. These studies were sponsored and published by NCERT. Studies in economics of education were conducted by several scholars, including the more well-known ones by Tapas Majumdar, Nalla Gounden, and Panchamukhi. NCERT supported the well known studies in science education by V.G. Kulkarni of the Homi Bhabha Science Centre at the Tata Institute of Fundamental Research in Bombay. Curriculum development in science subjects at the school stage were sponsored by the NCERT under various study groups guided by well-known scientists. NCERT initiated studies in deprivation child development and education. With the emergence of the Indian Council of Social Science Research in 1969, interdisciplinary research in education got further scope. But the availability of funds and a climate for interdisciplinary research were not sufficient to stimulate growth of such research in education, because we have still a long way to go, even with two decades of research effort behind us. It was only in 1982 that a university department of science accepted for the first time in India a Ph. D. thesis in science education.

Difficulties in Interdisciplinary Research in Education

10. One of the difficulties arises out of the rigid barriers of faculties in the universities, due to which interdisciplinary research in the universities is rare. A thesis on a subject in sociology of education will be acceptable in education, but not in the sociology department. This is true of economics of education, as well.

11. Interdisciplinary research has some knotty problems to sort out. The more advanced a discipline is in research, the more it develops and requires specialization. It will indeed be a rare case where a high degree of specialization does not narrow down one's interest so as to preclude any sizeable investment of time and energy in interdisciplinary research.

12. Another problem is the competitive academic culture, which requires just for the sake of survival more and more of research in a narrow area of specialization in one's own discipline. There is hardly any incentive

for interdisciplinary research. One can climb the academic ladder, only through one's own discipline. It is only a second rate person in a discipline who will look beyond the boundaries of one's own discipline, for he has no reputation to lose, and on the contrary, he may gain. Education is the Cinderella in the academic world as well as in the world of industry and agriculture.

A Study of Continuous Evaluation of Pupils in Schools: An Example of Type I Research

13. One of the educational reforms recommended in India is that of the examination system. The over-riding importance of the annual examination has been criticized by many educationists. A continuous internal evaluation has been recommended, instead. The objective of the study quoted here was to see whether a continuous assessment can be introduced in our schools, and whether it would produce the kinds of results that were expected. The research was supported by the NCERT and was completed in 1982.

14. Several hypotheses were formulated. One was concerning the improvement of learning as a result of continuous evaluation. This meant that there should be a Control group and an Experimental group and their should be some criterion measure to judge the improvement of the Experimental group over the Control. The second hypothesis was with respect to the types of school, that there should be no difference in results due to school. The third hypothesis was with regard to the subjects, that the improvement in learning should show equally in both science and mathematics. The fourth hypothesis was with regard to the socio-economic class to which the parents belong and the hypothesis was, as expected from earlier studies, that class differences would be in favour of the higher. One of the important conditions of continuous evaluation is immediate feedback to the learner and the feedback could be of various types. The fifth hypothesis was regarding the types of feedback, that a feedback with positive comments would be better than other types.

15. A research design with experimental and control groups was drawn up. Schools were randomly assigned to the experimental and control groups. There were two types of schools: Government-run schools and private schools. The age groups selected in the sample was 14 years usually in class VIII. The study was restricted to boy's schools only, in order to reduce the complexity of the design. The syllabi of science and mathematics were analyzed along with teachers and units were identified which would be tested at intervals, as the teaching progressed in schools. For each unit, the educational objectives were identified

for the cognitive domain only and objective test-items were written. Thus, there were a series of tests for both science and mathematics. The teachers were required to administer the tests as per schedule of testing which was once every fortnight. The teachers were kept out of the writing of test-items, as this would have required additional training time, not available to the researcher. The results of the tests were given back to the students by the teachers the day following the administration of test. There was a questionnaire for the parents to fill in regarding information on the child and the family.

16. In analyzing the results a comparison was made of the gain score in evaluation between the experimental and control groups, the control groups having taken the same initial and final tests, as the control groups were from the same class in the same school as the experimental. Randomization and large sample techniques were adopted in order to statistically control the intelligence factor. The results showed that, while both the experimental group and the control group learnt, the rate of learning was faster for the experimental group and the mean score was also higher. In other words, the first hypothesis was corrobated. But, the results were clear for science and not for mathematics, which raised several questions about the teaching and learning of mathematics, the learning curve behaving rather erratically. The results showed that there was a little superiority of the private over the govt. schools, but it was marginal, which goes against the usual opinion that private schools are better, generally. It was also interesting to find that the results were not in favour of the upper classes in socio-economic terms. The crucial factor was father's education and occupation. Children coming from homes where the father has higher education and is working in the educational or scientific line tend to do better. This is because the father spends time in teaching science and mathematics to the children. As regards the type of feedback, the differences were marginal. An interesting finding was that the learning curve of the control group, which had not received continuous evaluation, also was a rising curve. So, not that the children do not learn in the absence of continuous evaluation, or any evaluation for that matter, they do learn, and in ordinary schools as well.

Prospects of Interdisciplinary Research in Education in India

17. The future of interdisciplinary research in education depends on various aspects of the development of education itself. In India, it

seems that in the next decade or two, education is going to change in a big way. This expectation is based on the transformation that is taking place in the country as a whole in all aspects. Particularly, education is in a process of change. By 1990, the country should achieve universalization of elementary education, although, *prima facie*, it appears to be difficult. Secondary education has already been upgraded; it should be stabilized in a decade and vocationalization at the higher secondary education achieved. The kinds of courses offered at the college and university levels would also reflect the changes in the school education and would be upgraded and diversified, including vocational courses. The impact of the developments in science and technology on the courses as well as the delivery system would bring in more flexibility in the entire educational system as well as in the development of in-service education in all sectors of employment. The institutional structures which have developed so far would undergo changes in order to cope with the demands of diversity, flexibility and rising expectations among all sections of the people. The developments in communication technology and computerization would have an impact which the educationists are unable to judge today. Already, there is NCERT at the top, followed by state level counterparts of NCERT in practically every state. These state level institutions are likely to develop considerably and develop, in their turn, as NCERT did in their case, district level institutions, and may be even some block level institutions, by the turn of the century. Already there is a good deal of interest in education among the people. This interest is likely to influence the universities and make it possible for the academics in various faculties of the universities to move in the direction of problem-solving in education. The opening up of education, it seems, is the major change which would make interdisciplinary research a meaningful endeavour.

18. The training of the educational research worker is at present not oriented towards interdisciplinary research. This has to change. NCERT did visualize such a change, but has not yet been able to put it on the ground. With the kinds of developments in the country visualized above, it should be possible to introduce the kind of training for interdisciplinary research necessary in order to link education closely with development and respond to felt needs. Universities are also likely to develop centres for interdisciplinary research in education, particularly in higher education. Industry, agriculture, health, communication, technology and management seem to be already moving in this direction, and it is quite likely that there would be a sudden demand for interdisciplinary research in education related to the field specifically.

CONTRIBUTION OF INTERDISCIPLINARY RESEARCH TO THE DEVELOPMENT OF EDUCATION IN INDONESIA

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Introduction

The educational system whose main task is to plan, to arrange and to carry out the learning process for the development of man's ability and personality, involves several subjects (the parents' society, the society as a whole, the pupils and the educators). The product of this system will influence several social institutions, either economic and political or cultural. Based on this reason, in planning and carrying out the educational development, several factors should be noted. They are the characteristics and potential of the society and the parents, teachers, pupils and government's ability to provide the supporting factors for implementing the educational development. Whereas in taking into consideration the educational outcome which is usually formulated in the educational objectives, a couple of life's dimensions should be considered, such as the dynamics of the demands and expectations of the society.

Since the installation of Balitbang Dikbud (Office of Educational and Cultural Research and Development), this office has the task to assist the Minister of Education and Culture in planning and carrying out this educational development. In carrying out its task, Balitbang Dikbud is involved in research and evaluation of all educational components and elements. These activities are meant to get a clear picture of the shortages of the existing educational systems, before deciding the further development programme which will be carried out.

There are two channels of educational development which have been carried out since the Pelita (Five-Year-Development) I period, i.e.:

1. The channel of the educational development in the form of improvement and rehabilitation of educational facilities so that the existing educational system can function more adequately as known by the technical term of pembinaan.
2. The channel of educational development in the form of changing the whole or a certain part of the educational system such as the goals of education, the teaching material, the organization of the lessons, the planning system of the learning and the teaching programme which is known as pembaharuan (reform).

The educational development through the first channel such as the provision of equipment and books, the building of new schools and new classes and the upgrading of the teaching staff can be implemented without the test and trial process which follows systematical procedures of research and development. The channel of educational reform which involves changes, need to be carried out through a systematic planning, research and evaluation. Only then we can know for certain what the conditions should be in preparing for the implementation and the impacts on the educational outcomes.

There are two kinds of programmes in educational reform, i.e.: (1) the short-term programme whose outcome is hoped to improve the implementation of the system immediately; and (2) the long-term programme which involves the more fundamental changes.

The procedure and the educational development process as mentioned above is found in the Minister's decree number 41 in 1974 which was carried out in that very year.

The fundamental policy was that every innovation could only be carried out when its position and its function in increasing the capacity of the educational system were very clear. Besides, the output of try-out programme of the educational reform could only be disseminated when its strength and firmness were already known. On top of that, various mears needed for the implementation should be prepared carefully.

This policy was taken based on experiences in the past. Educational reform which was only derived from theories, had to face difficulties in its implementation. It was confusing to those who had to carry out the reform programme.

The Significance and the Aim of Educational Development

Educational development in this context covers the efforts to change, to reform or to use new elements in the educational system, either as a whole or just a part of it. All these efforts are carried out to improve and to adjust that system to the dynamic demands of the national development. So, it is assumed that the educational system, as an integral part of the social system of a country, can function to support national development process through the development of man's ability and personality to fulfill the needs of the growing society.

The Scope and the Depth of Educational Reform

The educational system covers several components such as primary schools, high schools, universities and out of school education. Each com-

ponent consists of elements such as the programme's structure, the materials and the organization of the programme, the delivery and evaluation system, the administration, the facilities, the manpower and the educational goals.

Educational reform could cover all the components and its elements, a part of a component, or some elements of a component. Development could also be seen in the form of: to change, to improve or to reform certain elements or to use new elements.

Research, Development, the Decision of the Basic Policy and the Direction of the Educational System

Research forms the first step which has to be done so that we can learn the strengths and the weaknesses of the educational programme. Based on the information we can get from research and further analysis on various alternative actions, the decision makers can decide what kind of policy can be taken.

How far has research and development been given a role in the policy of educational development? To give a brief picture, here are two cases:

A. The Development School Pilot Project.
B. The PAMONG Primary School.

A. The Development School Pilot Project (Proyek Perintis Sekolah Pembangunan or PPNP)

The Project on National Educational Assessment (Proyek Penilaian Nasional Pendidikan or PPSP) and a series of discussion on educational problems which were carried out in 1969 until 1972 found several weaknesses on the national educational system up to that time.

These results of research and evaluation lead to the formulation of the policy to renew fundamentally the whole primary and secondary educational system through the Development School Pilot Project. In this educational reform programme these stages were followed.

1. The period for the maturation of the concept

In this period an analysis was done to define what kind of elements have to be renewed and developed. General lines of the primary and secondary educational system which had to be developed were identified, and tried out by eight Teachers Training Colleges under the direction and coordination of the Office of Educational and Cultural Research and Development.

A study was carried out to identify primary and secondary educational goals which fit the hopes and demands of the society's development.

This study involved national experts, prominent figures of several development sectors, teachers and would-be-employers as resource persons.

2. The period of the material development and the try-out, phase I

Several working groups were formed whose members consisted of experts from Teachers Training Colleges which managed the Development School Pilot Projects, central governmental officers, university lecturers, and teachers from primary and secondary schools. These working groups were divided into five sections; each were working on: (1) curriculum development, (2) evaluation, (3) guidance and counseling, (4) school administration development, and (5) educational facilities development.

In its working mechanism, the Development School Pilot Project made attempts to get national support for the implementation of its concepts and ideas. Every product of development it achieved were always professionally reviewed in national forums which were held periodically.

3. The period of implementation of the try-out phase II, the limited disseminated try-out and the field preparation

In March 1978 all the dimensions of the Development School Pilot Project were ready to be completely implemented in the first classes of primary and secondary schools. Through the evaluation of the quality of the graduates during the first five years, in 1982 all the dimensions of the Development School Pilot Project were already studied. These could then be disseminated on a national scale.

All the dimensions of the Development School Pilot Project which are considered to be fit for dissemination will be done through the 1984-curriculum as a product of the improvement of the 1975-curriculum.

B. The PAMONG Primary School (The Child Education by the Society, Parents and Teachers)

All parents wish to have educations for their children, at least primary education. The government's policy is that education should be given to every citizen, because this is guaranteed by our constitution. At this time, this principle aims at compulsory education particularly at the primary school level.

At this context there are two problems which have to be overcome. These are: (1) to give those who are not able to go to the primary school regularly the chance to finish their study; and (2) to give the chance to those who live in a remote place or in areas which are scarcely populated.

To solve these two problems, the concept of the PAMONG Primary School system was introduced and developed.

The most important process in the PAMONG system is the process of learning, which gives the child the ability to study on his own. Through this method, the teacher does not have to spend much time to explain in class as in ordinary primary schools. Most of the teaching materials are presented in a form which can be studied by the child independently.

The PAMONG system is also aiming to solve another problem which is the education of skills. This system tries to solve it by recruiting skilled persons in society to assist the educational process.

The PAMONG system is also meant to develop social consciousness and to develop leadership. The development of social responsibility is carried out systematically by the system to study in groups, while the leadership education is developed through the tutorial system. Through this tutorship a child who is more gifted, is educated to assist his friends.

1. The Testing Process

The testing process of the PAMONG system is carried out through two phases. These are: (1) the phase of the prototype development; and (2) the phase of the model development.

The phase of the prototype development has been carried out in two villages in Central Java by the Sebelas Maret University. This was started in 1974.

In 1977 the phase of the prototype development could be considered as being finished. The prototype has been successfully found out and evidently the pupils involved could pass the last phase of school learning evaluation of the primary. Among those who passed are drop-out children and adults who were impossible to enter the regular primary school system.

The phase of the model development is carried out in Bali, Madura, South West Sulawesi, Central Sulawesi and South Kalimantan. Besides to test the ability of its mechanism and the routine apparatus for using this system, the phase of the model development is also meant to produce a manual which will be used by various officers in charge to disseminate this programme throughout Indonesia.

2. The Principles of the PAMONG System

a) The education participants are all children of the age of primary school

The first goal to carry out the execution of compulsory education on the primary school-level is that all children of the age of 7–13 years old can follow the primary school curriculum effectively from the beginning to the end. Through this way all those concerned can

receive a primary school certificate. The PAMONG system has shown its ability to carry it out. It does not only educate the pupils to follow the primary curriculum until graduation, but it can also be used by the drop outs.

b) The teaching material is the existing primary school curriculum

c) The essence of education is the process of leaning

In the PAMONG system the educational material is generally presented in the form which could and should be studied by the child himself, called the module.

d) Learning can be carried out everywhere

According to the life-long-educational policy, education can be carried out in many places, not only in a classroom. The PAMONG system is indeed carried out by using the primary school in the respective regions as its centre.

e) Education as a process of socialization and development of leadership qualities

In the PAMONG system many learning processes happen with learning in a group. In this group the child is encouraged to study together, to ask each other and to help each other. The more gifted children are appointed as tutors. The tutors help their friends with the process of learning. So, the institution of tutoring here is to raise and to develop leadership qualities.

f) Educators are not only teachers

In the PAMONG systems educators are not only teachers but also members of the society who possess ability, knowledge and adequate skills needed. This system carries out the principle that education is the responsibility of parents, society, teachers and the government.

g) Elimination of drop-outs

To eliminate drop-outs creates a major problem in education. By presenting educational materials in a form which can be studied by the child himself whenever or wherever he has a chance, the PAMONG system is evidently able to solve the problem of these drop-outs.

h) Progression is measured on the control of the learned materials and each pupil's speed of learning

i) Education is the responsibility of parents, society and the government

j) The teacher as the manager of the learning process

In the PAMONG system, the teacher has a new role. He has to stimulate the child to study well, to train tutors, to get active parents participation and to give remedial lessons. So, the main task of the teacher is to manage learning at all levels.

MORE THAN INTERDISCIPLINARY RESEARCH: POSSIBILITY OF INTER-PROFESSIONAL APPROACH IN RESEARCH

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Japan

I. Brief History

1. In Japan scientific approach into education started with Herbertian didactics which was introduced into Japan in the 1880s and it soon became very popular among teacher training institutions. For some time and well beyond the turn of the century it continued to be the central discipline of teaching as to be elaborately institutionalized in the normal schools. While in the research universities, psychology of education and sociology of education were added to their philosophical and historical studies of education before the Second World War. However, since all the educational studies were placed in the philosophical department in universities, major studies of education were done in the moral science and history.

2. The wave of the New Education Movement began to be felt in Japan in the 1920s. In contrast to teacher centered view of Herbertian didactics, this new movement propagated the child-centered philosophy. Empirical studies on children began with the movement that allowed pioneer researchers to see educational practices from much more broader perspective.

3. It was after the end of World War II that scientific approaches into education has gained an authoritative status in the department or faculty of education in universities. Disciplines in sociology, psychology, anthropology, economics, politics, etc., were gradually introduced into educational researches. Educational studies gained recognized statuses and allowed to independently form a department or faculty in research universities. In addition to them at least one state teachers college was set up in every prefecture, in which four or five teaching subjects, in addition to psychological studies, were mandatorily provided for students. They were, and still are, philosophy of education, history of education, psychology of education, developmental psychology, sociology of education or studies of educational institution.

II. Faculties and Teachers

4. Toward the end of the 1960s gradually an increasingly larger number of faculty members were found in teacher training colleges and research universities who had been specializing in a discipline different from that of the traditional studies of education. We can identify among them some who contrived educational research at least bi-disciplinarily. In the former times, because faculty members in the teacher training colleges had been mostly normal school teachers before, their perspectives were tended to be restricted.

5. Nowadays, although teachers have been exposed, in their four-year pre-service education at colleges and universities, to several different disciplines, it is often difficult for them to pursue educational research in one of these academic disciplines at the same time doing teaching every day. They are required to put greater attention to the preparation of teaching subjects and methods for tomorrow's lessons. The last point, however, has a great significance. Teachers should normally have a good knowledge of teaching process as practitioners. During their daily teaching they can observe what they do as participants and give disciplinary reflection, if they so wish, on their practice. Teachers are thought to be "situational decision-makers"[1] in the sence that they must incessantly coordinate and adapt their way of teaching to the changing learning situation. In other words, they are placed in a demanding situation to decide while they teach. In the consequence of those experiences they come to acquire tact, insights and knowledge of their teaching. Most of those knowledge are not universal in nature but effective in the classroom. In this sense teachers have a great premise to cultivate.

6. Teachers are also a specialist in one or two teaching subjects such as national language, mathematics, social studies or science. However the extent of their speciality, generally speaking, is not so high as compared to specialist researchers. But none can be as high a specialist of methodology of teaching as a teacher after he or she has experienced some length of time in the profession and given disciplinary reflection on it. For this reason teachers should be given a chance to go back to school to make excellent scholars of education out of them. If one or two disciplines are additionally acquired by a teacher through graduate work, for example, Ed. D. course in sociology of education or in a newly developing interdisciplinary area of study, we will be able to have a good model of bi-disciplinarily trained personnel actualized in a person. Such a person can even solely undertake an interdisciplinary research on education by him- or herself.

III. Modes of Approach

7. Educational researches are to be interdisciplinary by nature. Education cannot be adequately approached by one discipline alone. In other words, it can be studied by a variety of ways with many disciplinary orientations[2]. Thus higher level of research is possible when different specialists cooperatively conduct a research on a problem in education interdisciplinarily or multi-disciplinarily. It is a common usage of the term "multi-disciplinary" research when disciplinary wall is not taken away and disciplines are juxtaposed intact. On the other hand, the term "interdisciplinary research" is used if each disciplinary wall is removed and all the utilized disciplines are fully integrated one another to study an educational issue.

Professor Konomu Matsui at Rikkyo University asserts that there are three kinds among researches in general[3]. In addition to the above mentioned two, he maintains that there is a trans-disciplinary research. It is thought to be a matured state of amalgamation of several disciplines. (See Figures 1-3)

8. According to our experience most of joint studies are multi-disciplinary at best. In some cases they are only amalgam or patchwork completed by specialists having different disciplines and orientation. It is caused, for one thing, by the difficulty of maintaining highly committed and enthusiastic research team. Another reason for this is in the reward system of researchers in which they are evaluated by papers. Jointly written papers are difficult to be evaluated how much an individual contributed to it. Then, researchers like to have papers in which their names appear as the first author. Debate becomes less and enthusiasm cools down as time passes. Adequately integrated and coordinated researches are, in effect, hard to expect.

IV. Examples

9. The following are a few examples of either multi- or inter-disciplinary researches that were conducted in the National Institute for Educational Research: (1) Joint Study on School Violence: (2) Joint Study on the Role of Educational Research in the Reform of Educational System, Contents and Methods; (3) Social Effects of School Education; and (4) Autonomy and Public Nature of Private Schools, to name a few.

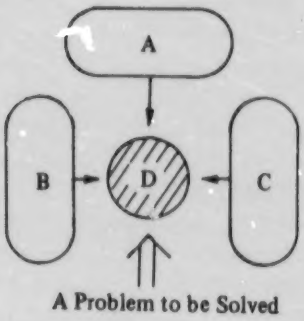

Figure 1. **Multidisciplinary Approach**

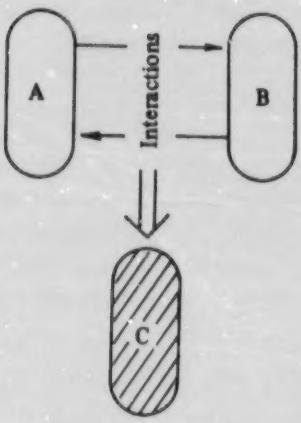

Figure 2. **Interdisciplinary Approach**

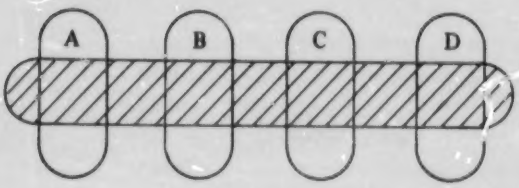

Figure 3. **Transdisciplinary Approach**

(Adopted from Konomu Matsui, "Development of New Technologies Coombining Brains", Voice (December 1981), p. 46

The second project on the above, i.e., a joint study on the role of educational research in the reform of educational system, contents and methods was jointly conducted by: (a) an educational psychologist; (b) an educational sociologist; (c) a researcher of educational administration; (d) a researcher-developer of educational equipment; and (e) a lower secondary school teacher. We made, in this project, a national survey on classroom teachers with regard to their affinity to and utilization of research outcomes. We analyzed returned questionnaires from each of our different disciplinary backgrounds, but, in the last stage, we felt we all shared very similar conclusions to the major trends that were found in the national sample of mid-leadership teachers. We felt that our research came near to be called an "interdisciplinary research", for we had been using repeatedly a bunch of research instruments developed in various disciplines and we were accustomed to a certain extent. More important than that was the merit which derived from the "inter-professionality" of the research.

10. Generally, researchers have a dangerous tendency to loose contact with the reality of educational scene even though they are gifted with high imaginative power and have trained disciplinary abilities to manipulate abstract terms according to their particular frame of reference in a particular discipline. Researchers are mostly trained through academic programmes at graduate schools. The programmes are solidly theoretical and bookish. It is rare to find professors or students who have ever had experienced teaching or managing in a school or in a school system. University programmes are separated from professionally experienced resource persons.

To a great extent this is caused, I think, by a cultural barrier between classroom teachers and researchers, however the base which brought this chasm has already gone. While researchers were considered to belong to a noble sector in line with university professors, classroom teachers were considered to belong to a less noble sector of quasi-professionals. It was evident until two or three decades ago to observe a different career patterns between university professors and classroom teachers. With the advancement of economy and the stride to a mass higher education, most of the people think that they belong to the middle class and class distinction which existed between the two professionals has vanished. Just in line with this socio-economical change, classroom teachers seem to have acquired confidence of themselves.

However, in educational institutions there still seem to have some leftovers of it in its structure. It is still true that most of the university professors are recruited from those who have sticked to be purely in academic world, namely those who have no professional experience being in teaching workforce or educational administration. Very curiously teaching at colleges or universities is considered secondary to research. In their consciousness college professors regard themselves most of the times as researchers and not as teachers.

For these reasons there is an indispensable merit to add suitable practitioners in a research team, however this might be an indigenous propensity only of our culture. I want to call this as an "inter-professional" approach.

11. Moreover, educational researchers have, quite often times, a research interest in a pinpointed area. They tend to loose sight of its relevancy or its meaning to the actual educational scene. At this highly specialized society it is quite understandable for the professionals to have that tendency in order to keep up-to-date their expertise. This narrow interest and perspective equally apply to the classroom teacher as well as the educational researcher. Along with institutionalization demarkations become increasingly stiffer in many areas of human activities.

We need to go back to the initial point. We must be educationist first of all. In these contexts there is a genuine necessity to cherish observation according to our common sense. Interdisciplinary research is requested in the the same line. That is a new mode of pursuit to replace old excessively differentiated and dispersed disciplines with an integrated one. That would allow us to see education as its totality and prevent us from entering into intricate nonsense.

V. Leaders of High Potential

12. There is a case for a supra-professional. Interdisciplinary or inter-professional research team must be led by somebody. The supra-professional is a figure who is beyond any particular prefession by definition. It is common to use "generalist" for such a person, but the term has a connotation that he or she lacks an anchorage. The supra-professional, instead, should have extensive knowledge in two or three disciplines. He or she holds very high leadership power, because he or she is committed to higher values and possesses deeper insights where we ought to go. The task of the supra-professional is to understand, unite and lead disciplinarily and professionally different specialists for the promotion of research activities. The supra-professional must be a versatile person. Such a figure is most

needed at the leadership position of an interdisciplinary or inter-professional research. He or she may as well be at the top leadership in an educational institution. If we can not find and develop such a key person, interdisciplinary projects will subside.

Note:

(1) Arthur S. Bolster, Jr. "Toward a More Effective Model of Research on Teaching," Harvard Educational Review, Vol. 53, No. 3 (August 1983)

(2) "... there is no more a special independent science of education than there is of bridge making" (John Dewey, The Sources of a Science of Education, 1929), quoted by Geraldine Joncich Clifford, "Research, Educational: History" in the Encyclopedia of Education, V.1.7, (The Macmillan Co., 1971), p. 519

(3) Konomu Matsui, "Development of New Technologies by Combining Brains," Voice (December 1981)

TWO WAYS TO DEVELOP INTERDISCIPLINARY RESEARCH

Hiromitsu Muta
Japan

1. Introduction

Because most of the people agree that an interdisciplinary approach is necessary for educational research in general, the issue is to find how to manage and pursue that kind of research. Interdisciplinary study is useful to research of problem solving or a marginal area of conventional disciplines, and itself becomes a new discipline sometimes. For example, economics of education is a powerful way of research on educational problems, and also it might be a new discipline in the future.

There are at least two ways to develop interdisciplinary studies in education. One is to have researchers work with specialists of different disciplines in a project team. The other is to lead universities to offer interdisciplinary courses and to support interdisciplinary researchers.

2. Project Team

The most frequent way of interdisciplinary research is to organize conventional specialists and to make a research team. Some specialists from several disciplines get together to solve a problem, and the final result is a report written by them from their views of own disciplines. However, in most of the cases, the result is not well integrated. Usually the result is a kind of patchwork, just the assortment of fragments of different disciplines. Each contributor writes a chapter without minding what the other writes. Anyhow through the work of the project the participant has an opportunity to expand his discipline or at least to understand other disciplines better. It is a kind of on-the-job training for participants.

At NIER we had a project on Social Effects of School Education. The research group was organized by specialists of several disciplines. At the final stage of report writing there were thirteen contributors; nine of them were from outside NIER and the rest were its staffs. There were two sociologists of education, a statistician, a researcher on educational finance and governance, two social engineers, two economists, a social psychologist, an administrator in the national government, a journalist, a director of a national research institute and a manager of a firm. The report has high academic level, and the effects of education were discussed from many points of view; however, frankly speaking chapters do not have enough interaction with each other.

3. Interdisciplinary Study at Universities

The more basic and long range approach to interdisciplinary research is to cultivate an interdisciplinary researcher. At universities and colleges, there are some courses of interdisciplinary study, such as urban engineering and social engineering, each of which is a combination of social sciences and technology. The subjects offered in the department of social engineering of Tokyo Institute of Technology are as follows:

City Environmental Planning
District Design
Economic Development
Exercises in Stochastic Processes
Industrial Economics
Introduction to Statistics
Mathematics for Planning
Practice of Social Survey
Resources Development & Allocation
Site Planning
Social Survey
Stochastic Processes
Transportation Planning
City Planning
Econometrics
Economic Planning
History of City Planning
Industry Planning
Mathematical Planning
Operations Research
Principles of Economics
Public Systems
Social Structure
Social System Analysis
Theory of Social Change
Urban Design
Systems Simulation Techniques for Urban Planning

The University of the Air of Japan, which will accept its first students in 1985, will offer an interdisciplinary course. The subjects in the course include inter-relationships between related academic areas, and integrated study of a specific subject which requires an interdisciplinary approach within a particular area of study. The subjects which will be offered are as follows:

Theory of life
Behavior and Responsibility
Social Security and Welfare
Existance and Value
Science and Religion
East and West in Literature
Physiology and Psychology
Urban Problems and City Policy
Population, food and Resources
Nature and Civilization
Environment Theory

Most of these subjects have a word "and", and it is attempted to make them interdisciplinary in nature, that is, an interdisciplinary subject C is a combination of discipline A and discipline B. It is obvious that the course is interdisciplinary to some extent, but professors who teach subjects are not. In general, each teacher teaches his specialized conventional subject or a part of the subject. They do not learn from each other at all. If so, who is interdisciplinary? Yes, the student is.

This is also happend in the medical world. Each doctor is so much specialized, for example, a neurosurgeon does not know well about stomach, and an oculist does not know about mental diseases so much. On the other hand a patient, who visits different doctors and gets information from them, know better about his body system than the doctors as a whole. In this case the patient is interdisciplinary but the doctors are conventional specialists.

4. Evaluation System

It takes time to have enough number of interdisciplinary researchers through university education; however, the point is not the time. A researcher or an university professor tends to be a conventional specialist because of the evaluation system of academic world. It happens sometimes that an interdisciplinary work is not appreciated by their colleges. In general positions at universities are for conventional disciplines and not for interdisciplinary study. The market of professors for new disciplines or interdisciplinary study is small. If one tries to find a position at university or get a Ph.D. degree, it is not advantage to do interdisciplinary research.

There are also difficulties to get research funds from the government sometimes, because the members of a judging committee are organized from conventional disciplines.

In a long term the situation will be somewhat improved anyway. In a short term the strong leadership of the government to give many incentives to do interdisciplinary research and also the role of private foundations to support interdisciplinary studies are expected.

INTERDISCIPLINARY RESEARCH IN EDUCATION IN MALAYSIA

Nor Hayati Abd. Rasid
Malaysia

1. Introduction

This paper is written based on the generalization that interdisciplinary research here would indicate the team approach used by experts of various disciplines in combining efforts in studying an educational issue. Interdisciplinary approach enables experts and research workers from many different fields of learning to be brought together sharing the same available facilities in the examination of a particular problem. In this way, findings and principles of more than one academic disciplines are combined and utilized when attempting to focus on some new areas of concern for analysis.

2. Situation of Interdisciplinary Research in Education in Malaysia

With the rapid growth and expansion of education in this country, the need for planned and systematic collection, analysis and interpretation of data becomes more important for an effective delivery of educational services and for its efficient management system. This importance is further magnified as rapid development takes place in other sectors of the country, and the role of education as a supportive factor to this development grows with it.

In brief, the educational research scenes in Malaysia can be classified into:

First, there is the group of educational research studies conducted by the agencies in the various ministries. For example, in the Ministry of Education, namely the Educational Planning and Research Division, the Curriculum Development Center, the Federal Inspectorate of Schools, the Technical and Vocational Education Division are involved in research works.

Second, there is the group of educational research studies conducted by international agencies such as UNICEF, UNDP, UNESCO, INNOTECH, Van Leur Foundation working in collaboration with individuals or teams of locally recruited researchers.

Thirdly there is the group of research studies conducted by undergraduates, graduate students and faculty members of the universities (foreign or local) in persuance of their professional academic interest or of their respective degree/diplomas in education.

Lastly, there is the group of research studies conducted by private individuals (local and foreigners) about education. Clearly, educational research in Malaysia plays an increasingly important role as knowledge base in building up an adequare information for educational services and management.

However, an examination of educational researches in Malaysia shows interdisciplinary research plays an increasingly important role in the local educational research scenario. The nature of the research activities conducted by the governmental organization is characteristically policy –, problem – and action oriented. The research projects and activities are designed to respond to the needs and requests of policy makers. Hence the findings and recommendations form the basis for policy formulations and plans for action. Whenever feasible interdisciplinary approach is being injected into researches. Another aspect of research in Malaysia is characterised by its single disciplinary approach used by the researchers in studying educational issues.

There are conditions that restrict interdisciplinary research to be used widely by researchers in Malaysia, although interdisciplinary research has been known to be able to make valuable contributions to knowledge about education, namely:

a) The Lack of funds

Educational interdisciplinary research cannot make the progress demanded of it until adequate funds are made available for equipment, manpower and supplies. Sometimes even if sufficient funds were provided, research would still be hampered by inadequately trained researchers and the use of inefficient research designs. Nonetheless, without adequate expenditures, the best designs or the best researchers are likely to fail.

b) Lack of training

Another factor which has hindered the development of educational interdisplinary research is the lack of training given to most professional educators in research methods. Even where adequate training has been provided, time constraints often interfere with the better judgement of researchers.

c) Compartmentalization of government bureaucracies

Bureaucratic organizations in the ministeries have the tendency to compartmentalize their functions according to their own goals and objectives. Thus this bureaucratic structure inhibits the growth of interdisciplinary approach in research.

d) Bridging the gap between researchers

Government red tapes tend to slow any coordination work between researchers of different ministeries/agencies. Also unwillingness to recognize the contributors and expertise of others tend to dampen the speed of the research project.

3. A Study on Preschool Education in Malaysia – a brief outline

a. Background

Preschool education as an institutionalised activity in Malaysia began in the 1950s. Since then preschool education expands rapidly by the private sector. Its concentration is in the urban areas and catered mainly for the affluent. Educationists and social workers begin to realise the existance of imbalances in the provision of preschool education in the country (in terms of curriculum, pedagogy, fees, staffing and training) and its importance for physical, social and mental development of the child.

On 17 November 1980, at the 67th meeting of the Educational Planning Committee, the Educational Planning and Research Division, Ministry of Education was entrusted with the responsibility to conduct a study on preschool education with the aim that it will provide some guidelines to the formulation of policy decisions. The study is co-sponsored by UNICEF. It is a three year research project 1982 – 1984.

The project is interdisciplinary in nature where experts from different areas of specialization combined efforts in the problem analysis research designs and in the planning of the new unified curriculum of preschool. Educational researchers and experts, from the Divisions of the Ministry of Education, were called upon to provide inputs to the study together with the experts of various disciplines from sectoral agencies which include personnel from the Ministry of Health, Ministry of Welfare Services, Ministry of National and Rural Development, Prime Minister's Department, Departments of Public Services, Department of Islamic Religion, Federal Land and Development Authority, University of Malaya, National University, Science University of Malaysia, Agricultural University of Malaysia, Kuala Lumpur City Hall, PETRONAS, Sabah Foundation, Islamic Religion Association, Malaysian Preschool Associations, UNICEF, UNESCO, UNFPA, Ministry of Defence, Rubber Industry Small-Holders Development Authority, etc. Two consultants were selected for the study.

b. Objectives of the study

1) To determine and to outline the role of the government/Ministry of Education in upgrading the quality of preschool education;
2) To assist the government/Ministry of Education in determining and formulating the general policies of the preschool education;
3) To determine the limits and nature of involvement of the government/Ministry of Education in supervising, coordinating and controlling the management of preschool agencies and institutions;
4) To determine the role of the Ministry of Education in the teacher training and curriculum development of preschool education in accordance with the needs of the New Primary School Curriculum; and
5) To oversee that the preschool education is in alignment with the national socio-economic policy in eradicating ethnical, aerial and regional imbalances.

The project hopes to come out with three studies on preschool education:

1) *An Evaluation Study* on the status of preschool education in Malaysia. The study focuses on the present pedagogical models used, curriculum (socio-emotional, perceptional-motor, cognitive and language development), teaching staff and training, finance (fees, salaries, etc.), basic physical facilities, management/administration of preschools at federal, state, regional levels, registration/supervision/coordination and other imbalances in the provision of preschool education.
2) *A Correlational Study* of preschool education with that of primary school education. The study focuses an important issues relating to the effectiveness and influences of preschool education.
3) *An Ethnographical Evaluation:* The study evaluates on the Unified Curriculum and its suitability for implementation in the preschools.

c. Research procedures

1) An evaluation study on the status of preschool education:
Design: Survey procedures are suitable for large population sample. The study also uses participation observation. For the first phase, the observation period lasts 4 days and the second phase it lasts for 2 days.

Sample: The sample composes of 5% of the total preschool population throughout the country. The study uses stratified purposive random sampling.

Instrumentation: Questionnaires to be answered by administrators/headmasters, teachers and parents; Checklists on physical facilities, administration of the curriculum, food components, health and financial situation; Structured observation and interviews to be conducted.

2) A correlational study of preschool education with that of primary school education

Design: Sample survey is used, using pre and post test design on the sampled population.

Sample: The primary school students in Standard I and II of the sampled schools are selected. They consist of students receiving preschool education and none. A certain percentage of the teachers teaching in Std. I and II from the sampled schools and administrators of selected sampled preschools.

Instrumentation: Questionnaires for the teachers of Std. I and II of primary schools and preschool administrators. Items tests for Std. I and II in subjects include National Language, English Language/Chinese Language/Tamil Language and Mathematics. Participation observation and interviews for selected preschools are conducted.

3) An ethnographical evaluation on preschool education

Design: Evaluative research is used. Specific indicators are recorded to arrive at an evaluative judgement.

Sample: A sample of preschool centres are selected for the research. The target groups are the preschool administrators/ headmistress, teachers and pupils.

Instrumentation: Participant observation for 4 months. The researcher is expected to record events as they occur.

Structured interview schedule where verbal responses of the respondents are recorded.

d. Findings of the study

The three reports have not been completed yet. Thus conclusions on the studies are unavailable. Neverthelese findings of the study will have implications on the general policies of preschool education in Malaysia.

4. Prospects for the Future of Interdisciplinary Research in Education

In Malaysia the future vitality of educational interdisciplinary research seems to be promising. This is so with regards to the integration of research and researchers from related disciplines into the field of education. Efforts have been made towards this development.

In the education world in Malaysia, the educational research machinery for educational planning and management is at the disposal of the Ministry of Education consisting of the Research and Evaluation Units at the Educational Planning and Research Division. Any educational researches are required to channel through this Division for scrutinizing, analyzing and evaluating. Hence this Division performs to some extent a coordinating research function. Also the research capacity of the local universities is being increasingly tapped by the Ministry of Education and efforts have been made to bridge the gap between academic researches done by the universities and action-oriented researches required by policy makers at the federal level. In this capacity the Ministry of Education is kept informed of the educational research development.

Thus the role of coordinating function of the Ministry enhances academicians of various disciplines and schools to share expertise and experiences in research analysis. Hence it provides rooms for interdisciplinary research to grow.

The nature of educational planning and research work necessitates adequate training and practice and officers are involved from time to time undergoing basic or advanced training as well as to participate in regional seminars and conferences in order to keep up with recent development in research. This step appears to meet the goals of the staff training programs instituted to upgrade the planning and research capabilities of the organization. Also at the same time it throws light on the possibility of creating awareness among officers on the benefits using interdisciplinary approach in problem analysis.

The importance of interdisciplinary research in education is further strengthened by the awareness of the need for cooperation between universities, research institutes and industries. National workshops on cooperation among these three agencies were held with the intention of recommending the setting up of the Industrial Research and Consultancy Unit in one of the local universities.

In conclusion, one can say that many of the educational problems in Malaysia need interdisciplinary approaches since no one problem can be solved effectively by a single disciplinary preference.

ADVANCING RESEARCH IN AN INNOVATIVE SPIRIT

John E. Watson
New Zealand

Building upon a Tradition

During the past five years, and coinciding with the new series of research seminars which NIER initiated in 1979, many nations have been reviewing the impact of research on their educational achievements and, in particular, at the role, functions and adaptability of their national research institutes. This world-wide trend has also reached an isolated and far-away place like New Zealand. We have therefore also been giving some thought recently to the future of our research policies and practices, as well as to institutional arrangements for implementing them.

In taking up this theme, as it bears upon the topic of this seminar, I trust that you will not consider it out-of-place for me to concentrate on the experience of the organization from which I have recently retired. My assumption is that its record has relevance to the purposes of this seminar.

Now, if one looks back on the impact of the research undertaken in the past fifty years under the direction of the New Zealand Council for Educational Research (NZCER) one quickly reaches the conclusion that its work has not been ignored by the community at large, or the teaching profession it serves, or by those who have a more direct role in shaping the country's educational policies. Moreover this support for, and expectation of high achievement, continues. If one traces the influence of individual projects or publications one is also fairly quickly persuaded that enquiries undertaken on a part-time basis, under the Council's auspices, by professors of history, or political science, anthropology or language and literature have been as influential as those undertaken by full-time, well-educated research staff with a background of teaching and multi-disciplinary training in research practices.

To these we may add the publications of the Council that have been prepared on the basis of studies undertaken by poets, teachers of music, linguists, librarians, literary critics and social workers. Beyond New Zealand's shores however, at the international level, it may be worth noting that the publications which have brought most acclaim to the Council have been those written by imaginative teachers or school principals. These have usually been gracefully-written descriptive accounts of the life of an innovative school or community rather than case-studies in the more academic sense. They have also been the most popular publications with practising teachers.

The beginnings of this emphasis on encouraging a wide range of people to analyze and write attractive books on educational issues dates back to the mid 1930's. At that time the total full-time staff of the organization was less than five people but the annual output of high-quality monographs was still sizeable because part-time, honorary scholars in New Zealand have never expected monetary rewards. Our experience therefore questions assumptions that a broad and flexible approach to research management inevitably requires a large organization or expansive funding. It may be noted too that, to a significant extent, the interpretation of its mission that was adopted by the New Zealand Council for Educational Research, when it was set up in the 1930's, has parallels with the mandates offered to comparable national institutes created in Asian countries in the 1960's. And the tradition persists.

In more recent times, a larger full-time staff of the Council has continued to reflect and to respond to the assumption that high-quality scholarship on educational trends, issues or problems should enlist the help of creative and imaginative minds wherever they may be found. We continue to accept the view that education is an area of development of the nation, and that our obligation, under legislative stature, is to encourage any discipline or area of imaginative thought which will foster that development. The task as we see it is to provide incentives and leadership for these objectives to be fulfilled and, taking the cue from the Council's original benefactor, the Carnegie Corporation of New York, we have chosen to avoid narrow definitions of what constitutes educational research. From the beginning then the Council, and its staff, have placed a high value on the imaginative qualities and creativeness of individual scholars, teachers and schools. Our disappointments have been few, marginal and manageable.

This should not be taken to mean, however, that New Zealand, or the New Zealand Council for Educational Research has resolved, or even attempted to accommodate either the limitations or all of the expectations of interdisciplinary approaches to research that have been identified in this seminar. The authors to whom I have referred have surely deepened our understanding of educational issues or prospects as these relate to the needs of our community and its schools. But we could not claim that their work has achieved significant advances in promoting conceptual interactions or methodological cross-fertilization between scholars of widely varying backgrounds. This will be evident at once to those who offer generous observations on our success in promoting collaboration between the various disciplines of educational and medical research, or other examples of similar collaboration from our work on early childhood education or on linguistic development and language teaching. In attracting scholars with varying backgrounds from universities, teachers colleges or

other institutions, our experience has shown that it is important to offer a consistent intellectual perspective of high order in clarifying national aspirations, and in identifying problems that may be expected in an area of widespread public concern. Given these conditions, we have no reason to doubt that the clarification of a nation's educational aims and purposes will attract at least a share of its best minds.

But at this time, and in this seminar, it may be of interest to observe that this traditional stance of NZCER has not been extended or reinforced in any deliberate way in the past decade or so, by those agencies primarily responsible for an expansion of funds for research from state sources. I refer especially to the policies and practices of the New Zealand Department of Education, the Social Science Research Committee and other quasi-governmental bodies funding research in universities. This is not intended as a critical observation for what we see is probably an inevitable, may be an inherent outcome, of the manner in which such government bodies distribute funds for research. As in most other countries, the amount of research financed from public funds has increased markedly in New Zealand in the past 20 years. In the main, it is offered under contracting arrangements for projects with an evaluative purpose. The basic aim is not to advance fresh or unsettling intellectual perspectives or to cultivate new ideas. And the possibility always exists therefore that a concerted national effort to expand educational research in this narrower mode, may deflect attention from the conditions required to foster innovative teachers and other creative artists who contribute so significantly to the vitality of an educational system as a whole. Fortunately, in our case, the emergence in recent years of vigorous associations for promoting the teaching of music, the arts, reading and so on, and the strong interest in research and development always shown by our professional unions, have maintained an adequate balance in the sources of intellectual leadership available to the schools. When we identify interdisciplinary influences on research promoted for educational advance I assume we will be as interested in the ideas which enliven the curriculums offered in the schools of any nation, as in the scholarly disciplines used to analyze the policies and practices of the system as a whole.

The Emergence of Specialisms

Research on topics relevant to education, and research within the teaching and learning profession, has been going actively for at least three-quarters of a century in New Zealand. In the past 50 years however, it has become a more self-conscious activity and this has been especially so in the past 25 years. To understand its impact, its functions, and the

types of intellectual ferment that may be created by the activities labelled "educational research" would really now require an examination of the total system of knowing about education of which research forms only one part. There are in fact, even in such a small country, many hundreds of men and women in colleges, universities, research organizations, or in publishing, and journalism or radio and television, for whom the production, organization and dissemination of knowledge about education is now a full-time occupation.

Even on a narrower front, this is hardly the place for me to examine how the various specialisms among professional educationalists construct different interpretations of educational reality and stimulate the development and use of different vocabularies to facilitate communication within their particular brotherhood or sisterhood. All of as know that professional jargon may hinder understanding and the development of shared meanings between such specialisms. We have to appreciate, however, that each specialism struggles to establish a map of reality that helps its members to achieve an intellectual world that is manageable. In the advance of science, this inwardness and in-group behavour, is essentially functional in providing for the refinement of methodology, the institutionalization of rigorous standards of verification and scholarship, and ultimately, for the discovery of new knowledge. Only a person who is steeped in a particular discipline and tradition of work, is capable of recognizing when reality fails to behave in accordance with the existing rules. Further, professionalization in such a specialism comes to provide orderly career structures, and its induction procedures help to minimize contamination from less structured guilds. In my view, we should welcome rather than denigrate this academic competitiveness as an essential conditon of intellectual advance.

The Search for Complementary Explanations

When we talk about multi- or interdisciplinary teaching or learning or research however we are seeking I assume, to identify a particular class of issues, or trends, or problems for which solutions will be facilitated, and analyses improved, if we are able to draw upon the complementary contributions from a number of disciplines. What we are seeking, if I judge it correctly, are explanations that enhance rather than compete with each other. The proponents of multi- and interdisciplinary research have high hopes, in other words, for a unification of the intellectual enterprise, and close collaboration between professional specialisms.

Unfortunately, these high hopes seem so far to have been only rarely achieved, in a convincing way. Through the past 25 years or so we have,

in my view, acted politely about the rhetoric of multi- and interdisciplinary research but we have made little progress in exploring its implications for research management and funding, or for data collection and analysis, or for the refinement of conceptual frame-works and the formulation of sound theoretical innovations. If we are to do better, the origins, the nature, and the limitations of this emphasis on interdisciplinary approaches is therefore a topic of considerable intellectual concern. There is scope in my view, for this seminar to become a significant benchmark in Asia and the Pacific in helping us all to come little closer to understanding the relationships that may emerge between understandings cultivated through this mode of research management and the broader corpus of public knowledge that activates the education systems of each of our countries.

Origins of the Interdisciplinary Emphasis

May I therefore begin by asking where does the emphasis on interdisciplinary modes come from in any Pacific or Asian country. Is it more common in complex industrial nations or in more simple economies, does it come from different strata in each professional specialism, or from particular sections of our client community?

It is easy to recognize, in the first place, that the research workers of most disciplines are anxious to ensure that their discipline becomes academically useful. Hence those at the boundaries of each specialism often seek insights from other disciplines to expand their own limited perspectives. This is all part of a constant, intellectual ferment through which human knowledge is expanded by the reformulation of new relationships between pure and applied knowledge.

The perceived problems or issues of each age promote new forms of interdisciplinary mingling and new intellectual marriages constantly reoccur, some of which create lively off-spring. Most of us in the short span of our professional lifetimes have been fascinated, sometimes astonished, by the theoretical bedfellows that form unions in such specialisms as guidance and counselling, educational administration, comparative education and so forth. Here we are witnessing an impetus to interdisciplinary research that is part of the essential dynamic involved in expanding knowledge itself. It is practised especially in universities where scholars compete for students, funds, respectability and a place in the intellectual sun.

But a very different type of impetus arises from research undertaken to clarify a national or institutional policy, or to evaluate a given practice or to provide a data-base for new educational and cultural aspirations a decade or more ahead. Typically in my country, government, teachers

organizations, educational associations or parent bodies identify problems or questions that they assume research workers will be able to clarify or solve, by whatever means they command. These invitations, requests and concerns may be resisted or welcomed. For an organization like my own however they have a critical bearing upon the scope for interdisciplinary research. Stated briefly requests for "problem-oriented" research usually do not hold disciplinary competitiveness or cooperation in special regard.

Despite the fact that NZCER has created a respectable record in attracting good minds and scholars from a wide variety of disciplines to research on educational issues of national importance, we cannot claim, as already stated, to have achieved distinctively new methodological advances or improved conceptual and theoretical sophistication through the interaction of scholars in interdisciplinary teams. It is true that as an organization, we accept it as commonplace that linguists or political scientists should enjoy the professional companionship of psychologists or poets, or economists, or mathematicians and so on. It is obvious too that language, mathematics, statistics, computing and historical insights are potential inputs to all the projects and studies we undertake. Indeed there is a sense in which the research policies and activities of national organizations like KEDI or NIER, or NZCER may all be seen as multidisciplinary. Still the creativeness of our data managers, or computer specialists and statistical innovators does not require them, or any other specialist in the team, to immerse themselves deeply in the intellectual concepts of the colleagues whose companionship they enjoy daily. It is true too that there are problems of management in organizing and leading interdisciplinary teams of this kind but these are not essentially different from these which arise from employing a staff of different ages, language backgrounds or ethnic origins. Nor does the resolution of management issues of this kind require distinctive financial provision or special incentives of a material nature.

Responding to Interdisciplinary Practices

From this context, and in situations where resources have to be assembled to foster professional collaboration among specialists from the fields of education, medicine and social welfare, the following questions about proposals for new programmes and innovations would have to be taken into account.

(1) Does the proposal with interdisciplinary expectations incorporate into its planning adequate recognition of the existing contributions being offered by the separate disciplines to be involved?

(2) Is the emphasis on an interdisciplinary perspective or approach genuine, in the sense that the problem is formulated in terms that will enable the different disciplines to get together rather than simply compete with each other?
(3) Are the methods of data collection, or acquisition and analysis, likely to be helpful to each of the relevant disciplines to be involved, or is the data biased in one direction?
(4) Does the emphasis on an inter-disciplinary approach enhance the possibility of hypothesis testing for each discipline involved or does it avoid prospects for theory building?
(5) What difference will the result of a proposed interdisciplinary investigation make to policy decisions to be made by a government, or an institution, a professional association, or a teaching profession?

Problems for the Future

While sharing the observations already made at this seminar on the difficulties of managing multi- or interdisciplinary research it would be unfortunate if we became unduly pessimistic about the prospects ahead. May I therefore conclude by offering three simple suggestions for promoting a more sensitive appreciation of the conditions needed for advancing multi-disciplinary research.

First, for these purposes, we need to overcome the tendency to initiate each project or programme *de novo*, instead of building upon the intellectual capital already accumulated by predecessors or peers in particular specialisms relevant to the topic to be investigated.

Second, if we are serious about assertions that multi- or interdisciplinary perspectives are important in influencing the aspirations of students, or teachers, or parents or policy makers, then we should ensure that it becomes intellectually advantageous for scholars to prepare for us unifying papers that reflect the objective.

Third, we need to encourage in forums, public lectures, or presentations on the public media, major discussions that are advanced by scholars from various professional backgrounds and disciplines. In the long-term it is essential that new intellectual trends and emphases be fostered in the public arena, at least in my own country.

INTERDISCIPLINARY RESEARCH IN EDUCATION IN THE PHILIPPINES

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Educational problems are essentially multi-disciplinary in nature, yet most attempts to gain deeper understanding of them have been circumscribed to inquiries made within the ambit of education alone, or if investigations are carried beyond it, they are limited to those who operate within the educational system.

The desideratum is to achieve effective communication and collaboration between researchers and specialists across disciplinary boundaries in order to gain greater understanding of educational problems. This can be attained through team research which adopts strategies that can bring together specialists from as many disciplines as are germane to the problem under study and are necessary for a clear understanding of it.

State of the Art of Interdisciplinary Research

In the Philippines, there has been growing awareness of the merits of interdisciplinary research and its contribution to educational development. However, a purposive scanning of researches conducted within the last fifteen years and interviews of leading researchers in the educational area reveal that it is still in the neo-natal stage.

Interdisciplinary (team) researches in education conducted in the country are few and far between because they entail great expense. Most of these studies were commissioned by agencies and organizations that can afford to provide generous funding for research, such as, UNICEF, UNFPA, the Population Commission, and the National Commission for the Role of Filipino Women.

Two patterns of interdisciplinary research in education have emerged in the country. In the first pattern, the research team members from related disciplines are involved from the planning to the research writing stages.

In the second pattern, the research team members from other disciplines are involved only at certain stages of the research, e.g., planning, or analysis of findings or critiquing of the research report. A common practice is to invite an interdisciplinary panel to critique a research report, and their reactions and suggestions are utilized as basis for finalizing it. Another practice is to involve specialists from related disciplines only

after data have been gathered by educationists and are ready for analysis. Still another practice, which is gaining popularity is to form an interciplinary panel of consultants to advise a team of researchers drawn from the education sector. The researchers convene meetings with the panel of specialists as often as they need their advice.

The second pattern, which may be regarded as a quasi-team approach that allows as many permutations as a specific situation may demand, has generally been adopted for its cost-cutting potential.

One inherent weakness of the quasi-team approach to interdisciplinary research, especially where data are gathered by those within the education system alone while analysis and interpretation of such involve specialists from related disciplines, is the problem of credibility. The specialists from other disciplines may doubt the objectivity of the research data since they were collected by personnel who work within the education system alone. This is one potential cause of conflict among research team members which may lead to their discrediting each other and consequently denting the quality of the research.

This brings us to the other reason, besides fund constraints, why interdisciplinary research has not gained much ground in the country. This type of research requires that educationists and specialists in related disciplines be welded into a cohesive team in order to achieve specific research objectives. The team, in order to work effectively, requires a leader who can marshal both human and material forces in the direction of the common objective.

A common observation, which has been confirmed by some researchers interviewed, is that interdisciplinary team research is often stymied by difficulty in integrating a research team composed of scholars of varying disciplines, persuasions and personalities. Conflicts tend to arise especially when some members of the team nurture the counterproductive attitude of omnipotence over the rest simply because they are recognized leaders in their own discipline. This *prima donna* behavior tends to alienate other members of the team thus unfavorably affecting the quality of team work.

Another unhappy situation may arise in the course of research team work when professional jealousies are manifested. In such a situation, the research team leader may find it doubly challenging to integrate team efforts, and as a consequence, he may tend to address his efforts more to achieving expressive objectives, thereby neglecting the instrumental objectives of the group.

To accelerate the progress of interdisciplinary research in the country, it will be necessary to dent two problems which militate against its ascendancy, namely inadequate funding and need for team building among specialists of varying backgrounds.

Example of Interdisciplinary Research in Education

One interdisciplinary research conducted recently titled "Values of Filipino Women: Their Implications for Education, National Policy and Social Action",* may be cited as an example of interdisciplinary research. The research, however, involved specialists from related disciplines only for critiquing the research report and for further analysis of data.

The research may be replicated using a younger sample, i.e., school children, and the participation of both the researchers from within the education system and specialists from related disciplines will be harnessed from the planning to the research reporting stages.

Following is a proposed outline of the suggested interdisciplinary research. It is an adaptation of the research cited above.

Title: Values of Filipino Grade School Children: Their Implications for Education

Objective: To identify the values of Filipino Grade School Children pertinent to fundamental social institutions, such as, family, school, church, government and mass media.

Research Questions:

1. What values are reflected by the cognitions, beliefs, preferences, aspirations, attitudes, behavioral predispositions and behaviors of Filipino grade school children?
2. Do their values differ because of (a) ethnolinguistic origin and affiliation, (b) type of community residence, (c) socio-economic characteristics, (d) age, and (e) grade level?
3. In what activities in the home, school and community does each sex want to be involved? To what extent are these activities related to their values? their role perceptions? their social circumstances?

Methods and Procedures: The study will be carried out in three phases:

Phase 1: Exploratory study of the values of grade school children.

Data-collection will utilize a combination of survey research and ethnographic research techniques, mainly participant observation.

* Conducted by Josefina R. Cortes, Trinidad C. Baldo, Celeste O. Botor, Milagros Ibe and Priscila S. Manalang of University of the Philippines, College of Education, Quezon City, Philippines and financed by the National Commission for the Role of Filipino Women, Manila, 1983.

Data-collection instruments will mainly be open-ended questions.

Phase 2: Pre-test of research instrument

The results of the exploratory study will serve as the basis for developing the research instrument.

Phase 3: The national study

The study will be conducted in ten (10) different communities representing major ethnolinguistic groups in the country. The random sample will total 1000, i.e., 500 males and 500 females.

Expected Outcomes: The values of Filipino grade school children will be reported under the following categories: economic, political, philosophical and socio-cultural. The profile of the self-concept of Filipino grade school children will be drawn up on the basis of the findings of the study. The findings, conclusions and recommendations of the study will be useful for curriculum development, policy and program formulation for elementary education.

Strategy for Involvement: The research team shall be headed by an educator and shall include, besides other educational researchers, specialists in economics, political science, philosophy, social psychology and anthropology. The mechanism for bringing them together is consultative meetings in which problems and issues relevant to the research are threshed out. The specialists from related disciplines may or may not participate in data gathering, but they must by all means participate in developing the research design and instruments, analysis and interpretation of data and writing, critiquing and finalizing the research report.

Scenario for Interdisciplinary Research in Education

The progress of interdisciplinary research in education in the country will depend very much upon how well the need for it can be matched with adequate funding. Since government funds for educational research have been woefully inadequate, the desire to mount interdisciplinary research addressed to educational development will propel those concerned with research on educational problems to seek fund sources outside, i.e., local and international funding agencies. This trend will continue, and the years to come will witness heightened interest in interdisciplinary research. Because of the present economic crises which has constrained the government to effect stringent economy measures, the need for sufficient funds to support interdisciplinary research will not be immediately met.

Behind the dark cloud, is a silver lining in the form of additional funds that may be utilized for interdisciplinary research from the research component of the five-year World Bank – assisted Program for Decentralized Educational Development (PRODED) for elementary education. Its Committee for Educational Research Development (CERD) has recently lined up some research areas which require interdisciplinary treatment. These include among others management incentives for teachers and administrative and supervisory personnel, schemes for delivering effective education to the fast learners and the gifted, non-traditional ways of delivering in-service education, and raising the achievement levels of children and management of elementary schools.

It is envisaged that there will be increasing need for interdisciplinary research projects to be mounted in the next few years, and government will be constrained to progressively increase funding support for them. As a consequence, there will be greater capability on the part of educationists and specialists in related disciplines to conduct team research, resulting in an increasingly richer fund of research findings generated through interdisciplinary research which can contribute to sound policy and program formulation. As the year 2000 comes close, interdisciplinary research will be fairly well developed and will optimize its contribution to educational development.

INTERDISCIPLINARY APPROACH TO EDUCATIONAL RESEARCH

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Introduction

Education is considered as a phenomenon of life that cuts across all the aspects of human living. Education research seeks to understand and describe the phenomenon of education and to supply specific answers to important technical questions in educational operations. Sometimes the issue is so narrowly educational that it belongs solely to education research, but such cases are very rare. Since the subject matter of education is as broad as human life itself, educational research shares its subject matter with other disciplines. Overlapping research interests are found in many problem areas of education. Take the problem of drug use among students for example. Pharmacological, medical, and psychiatric research may be focussed on physiological effects, remediation and associated personality traits. Sociological research may focus on social class correlates of drug use, socialization, value changes, and group dynamics in the campus drug subculture. Political scientists may be interested in relating drug phenomenon to campus unrest and political milieu of the society. Experts in school curriculum may focus their research efforts on the correlates of drug use with student achievement.

In educational research literature one finds several different terms being used to describe scientific research efforts which involve input from more than one discipline. The term "cross-disciplinary research" is mainly used to refer specifically to the kind of research undertaken in the overlapping areas of two or more adjacent disciplines such as "biology and chemistry", "sociology and psychology", or "education, sociology, and psychology". These cross-disciplinary efforts may eventually yield new disciplines such as "social psychology of education".

One hears such term as transdisciplinary research which is used to describe efforts which involve the extension of activities in one discipline across boundaries into another discipline.

The term "multidisciplinary research" is used to refer to the kind of research which brings together a number of researchers representing different disciplines and thus share common research facilities, common research approaches, common environments, or together search for funding or a joint grant request from a funding agency. In this approach, however, the problems tackled by individual researchers do not necessarily require

the integration of the research on the specific problem in question. The individual researcher is expected to work on problems specifically relevent to only his own discipline.

The term "interdisciplinary research" is usually used for those situations in which the problems or issues in question require a group of specialists representing various disciplines to integrate their efforts and approaches. Since the specialists representing various disciplines are seeking to reach a solution to the common problem, an interactive joint effort becomes a basic requirement.

Interdisciplinary Approach to Education in Korea

The need for interdisciplinary approach to educational improvement has been strongly advocated since the 1960's in Korea. Interdisciplinary approaches to improve educational practices has been a common practice in Korea. In many research projects in the area of curriculum research and development, scholars and specialists from various disciplines had to be invited to participate in the work. They worked together in curriculum evaluation, curriculum organization, and the development of new curricular syllabi. The steering committee of curriculum development in the Ministry of Education is composed of scholars, leaders, and specialists representing various disciplines and different sectors of the society. Cooperation among curriculum theorists, psychologists of learning, and scholars in various academic disciplines is becoming a pattern in curriculum development. Different subjects have their curriculum study teams, each of which is composed mostly of specialists representing more than two different academic disciplines. The Moral Education Study Group is a good example of the interdisciplinary approach to educational improvement. The group is composed of education specialists, historians, philosophers, sociologists, political scientists, economists, natural scientists, and leaders from various areas of life. Proceedings and collections of articles have been published. In the area of science curriculum, cooperation between curriculum theorists and scientists has been long established and its effects are well demonstrated in the improved science curriculum. Another good example is found in the physical education research area. There has been cooperation among physical education specialists, psychologists, physiologists, mechanical engineers, and research scientists. Attempts are also being made to invite anthropologists to utilize their expertise in ethnographic methods in the analysis of curriculum practices and the teaching-learning process.

There is a growing awareness among policy makers as well as the public for the need of a research base for effective educational policy making. Since the educational system is an integral part of the total social system, problems or issues that the educational system faces today cannot be effectively solved by the efforts of experts in any single discipline.

An increasing amount of government funding is provided for research projects that are needed by the educational policy makers, and most of the projects are conducted by teams of people representing various disciplines.

The project *"Comprehensive Diagnosis and Prescription for the Korean Education System"* is a good example of an interdisciplinary research funded by the government. The project was conducted by the Social Science Research Institute of Seoul National University in 1980. Fifteen researchers were drawn from various departments to form a project team. Four researchers were from the department of education, while others were from departments of sociology, political science, economics, public administration, business administration, history, and natural science. The purposes of the study were stated as following:

1) An analysis of the fundamental characteristics of Korean education in terms of its appropriateness, efficiency and equity.
2) A comprehensive analysis of the problems which confront Korean education in terms of educational policy, educational finance and employment. It also aims to clarify the socio-economic, cultural and psychological factors related to these problems.
3) Based on the above analyses, the purpose of this study is to present the direction Korean education should take in the future and suggest policy measures for achieving above objectives.

In regard to the approach taken in the project, the researchers emphasized that "it is necessary to take an approach that can overcome the fundamental weaknesses of previous approaches which were limited by seeking solutions to aspects of the problem. There was pachwork policy implementation resulting from limited analysis and short term policy as indicated by research into past educational reform." The researchers continue to say:

"Therefore, in dealing with educational problems, this study attempts to take a broader social sciences approach rather than being limited to the pedagogical approach. This study begins with the basic position that it is necessary to approach the educational phenomena, which has already emerged as a social issue at the national level, from the standpoint of the larger sociological, political and economic contexts. In this premise,

the attempt is made to diagnose basic causes and symptoms of the problems and with proposals for their solution in the posture that a comprehensive diagnosis will be done from the broader viewpoint taking into consideration the approaches of various sub-fields of the social siciences."

The project *"Urban School Model Development"* is another example of an interdisciplinary study. The project was carried out by the Educational Research Institute, Seoul National University in 1981 and was financed by the Seoul City Board of Education. Two educational researchers and three other specialists (one architect, one city planning specialist, and one public administration specialist) formed the research team. The project was to design an alternative school model which would help to solve serious problems caused by over crowded classrooms and unmanageably large schools that existed in the City of Seoul. The City of Seoul has a rapidly growing population, yet the area is limited and it is becoming extremely difficult to find sites for new school buildings.

Specific purposes of the study were: (1) to design a small size school that is educationally sound and suited to the densely populated area; (2) to explore the maximum utilization of available resources for better educational programs; (3) to identify legal and financial constraints anticipated in the process of implementation of the new alternative school structure; and (4) to devise ways and means of overcoming the anticipated constraints.

The team worked together in planning and carrying out the project. Although there were times when each researcher worked independently, all work done by each researcher was brought to the team for final integration into a comprehensive plan. Different modules of school buildings layed out, together with proposed program alternatives and a set of recommendations for the implementation of the new model were made in the final report of the study.

The project *"Innovations in the Entrance Examination System"* is also a good example of interdisciplinary research directed toward improving a major educational policy. "Entrance examination hell" is an expression used to describe the seriousness of the social problems resulting from the competitive entrance examination system and examination-oriented educational programs of Korean schools. The causes of the problem are complicated and permeated into almost all areas of life so that no single discipline is broad enough in its view to grasp the whole picture. Recognizing the complicated nature of the problem, the Ministry of Education invited eight scholars with different academic backgrounds to form a research team to work on the problem. Among the eight were the following, one education specialist, one psychologist, one historian, two political scientists, one sociologist, one natural scientist, and one from the

humanities area. Causes of the problem were traced through the perspectives of various disciplines. Individual studies, brainstorming sessions and seminar sessions were alternately used for developing and intergrating ideas related to the solution of the problem. The result of the project was one comprehensive set of policy measures to be implemented by various ministries of the government, educational institutions of various levels, social agencies concerned, and parents and the public. Since a wide participation of policy makers at different levels was enlisted in the process of project development, one can be optimistic about the results from the implementation of the proposed measures.

Prospects for Future of Interdisciplinary Research in Education

The fact that education research shares the subject matter with other disciplines does not necessarily mean that education as a field of discipline is diminishing its unique identity. It means, instead, that education as a field of study is forced to expand the scope and depth of its inquiry in a close interaction and cooperation with other related disciplines that share the same subject matter. Despite the growing need for interdisciplinary efforts in solving the problems and issues of education, one can find little interdisciplinary research carried out in a systematic way. As indicated earlier, there have been some interdisciplinary studies carried out in the area of curriculum development and policy making. Little of this literature is empirical. Most of it is of historical nature, descriptive surveys and conference proceedings. Even the few studies which are empirical tend to be descriptive rather than testing hypotheses generated by theory.

Much effort needs to be expended to foster the interdisciplinary approach to education research, which will produce significant new knowledge that will explain the complicated educational phenomenon we face. We are far short of a significant knowledge base in many areas of educational decision making.

In order to facilitate an interdisciplinary approach to educational research, the following matters need to be given serious considerations:

1) The training of educational researchers so that they are with the knowledge and techniques required for effective interdisciplinary research;
2) The application of innovative research management for better organization, coordination, and securing of financial resources for interdisciplinary educational research;
3) The development of a system of communication among different disciplines and institutions.

INTERDISCIPLINARY RESEARCH IN EDUCATION IN THAILAND

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Introduction

Interdisciplinary research as defined by Hallenbeck (1956) is a team job in which specialists in different areas, using different approaches to their study, work together on a problem requiring research in order to analyze various aspects of the problem in their relationships. If we are agreed to use this definition, we have to select specialists from an appropriate discipline in order to work together. Disciplines that seemed to be appropriate to work with are psychology, sociology, anthropology, economics and history. This does not mean that some other disciplines are not appropriate, but the particular fields to be selected would be dictated by the requirements of the particular research study.

Interdisciplinary Research in Thailand

According to the reports of three NEC's biannual national research symposium (1979, 1981 and 1983), there were about 1,700 educational research studies conducted within the period of 10 years. About 1/3 of research studies were primary education, 1/4 were secondary education and the rest were teacher training education, and tertiary education respectively. Almost all of the research studies were in the field of education. There were only small number on some other educational related field such as psychology, sociology, anthropology, economics, history and philosophy, etc. However most of the research studies conducted in Thailand were done in accordance with the requirements of the institutions in which the researchers worked with or studied in. The research studies could be classified as policy oriented research, curriculum research and institutional research. About half of the research studies were theses or dissertations of the university students.

The institutions that have been undertaken educational research can be classified as 4 types as follows:

1) Educational Faculties in the universities,
2) Teacher Colleges,
3) Research and Planning Divisions in the Ministry of Education and Office of the National Education Commission (NEC), and
4) Superisory Unit in the Offices of Regional Education in 13 regions.

Cooperation on techniques and methods of conducting research have been increasing. The conventional scientific method of doing educational research has been used for years, but at present another approach (called qualitative approach) which has been used by some other disciplines has been increasingly supplemented in conducting educational research. However, ideal interdisciplinary research in education is still very difficult to find in Thailand. What we can find might be called inter-institutional cooperation research study or joint project educational research studies. For the joint project research study, a group of researchers from institutions concerned would work together from the beginning through the end. The example of such research studies can be found easily. However the researchers who work together in a particular project normally come from only one discipline, i.e. education with some specialization in related fields such as educational psychology and science education. For some particular research studies, specialists such as criminologists, child psychologists or moral educationists might be of great use in building research teams.

An Example

One example of research study conducted by the Department of Curriculum and Instruction Development was the Experimental Research Study on the Teaching Models that Facilitate the Teaching-Learning of Morality. This research study was conducted under the supervision of an advisory committee. This committee consisted of researchers and educationists including psychologist, guidance specialist, moral educationists, from various institutions within the Ministry of Education and university. Brief outlines of the study were as follows:

The Objectives

The objectives of this study were as the followings:

1. To synthesize the knowledge and ideas concerning the practical teaching models of morality.
2. To develop teaching learning models on morality.
3. To conduct experiment on teaching learning models in schools.

Procedures

A simple random sampling were used in this research study. Eight primary schools and eight secondary schools in Bangkok were selected. One class from each school was randomly selected. And finally randomly assigned each class as control group and experimental groups 1 and 2.

Two schools were assigned as control group, three schools were assigned as experimental group 1 and other three schools were assigned as experimental group 2. For primary school level Grade 3 was selected and for secondary school level Grade 7 was selected.

The teaching models

There were at least nine models of teaching morality emerged from the discussion of the committee (some wellknown experts were also invited to the meeting) such as group process, value clarification, role playing, behavior modification, concept and principle learning, couseling, meditation and modeling. From these theoretical teaching models it was agreed that only two approaches seemed to be appropriate for the experiment, and they were behavioral approach and value clarification approach. Therefore the research committee decided that only these two approaches would be done experimentally in the randomly selected schools. The next step was to prepare the teaching modules and then to provide inservice training to the teachers who participated in the program on how to utilize the teaching modules.

The period of experimentation was two and a half months, that is approximately one semester, started in June 1981 and continued up until August 1981. As usual the control group was not exposed to these two teaching modules but used the conventional method of teaching.

The Instruments

Instruments for using in this study were classified into 2 types and they were:

1. Test to measure morality reasoning of pupils.
2. Observation Instrument
   - 2.1 By teachers
     - 2.1.1 pupils' behavior checklist
     - 2.1.2 individual pupils' behavior evaluation form
     - 2.1.3 teachers' questionnaire

2.2 By researcher

2.2.1 pupils' behavior checklist

2.2.2 classroom teaching learning climate checklist

Data collection techniques were as follows:

The observations were divided into 4 steps as follows:

1. Base line period, one week before the experiment,
2. The starting of the experiment,
3. During the treatment period, and
4. At the end of treatment.

All of the collected data were analysed using mean, frequency, standard deviation and t-test.

The Findings

Three criterion variables were used to compare the effectiveness of the teaching models with traditional teaching. The three variables were moral reasoning development scale, teacher rating scale and classroom observations. The findings indicated that these two teaching models were more effective than the traditional teaching on moral reasoning development scale for both levels. Another findings indicated that for elementary school level the behavior modification approach was better than value clarification approach.

Prospects for Future of Interdisciplinary Research

Since an interdisciplinary view of research now recognizes the increassing interdependence of problems and procedures in education, psychology, sociology, anthropology, economics and history, therefore the educational research in the future would be using more interdisciplinary approaches. However I would rather think that future of research in education is difficult to predict. Therefore in the future I would like to see more interdisciplinary approach being used in educational research in order to obtain view of educational system. And in addition multi-technique approaches should be considered as another alternative way for solving educational problems and for educational planning in a near future.